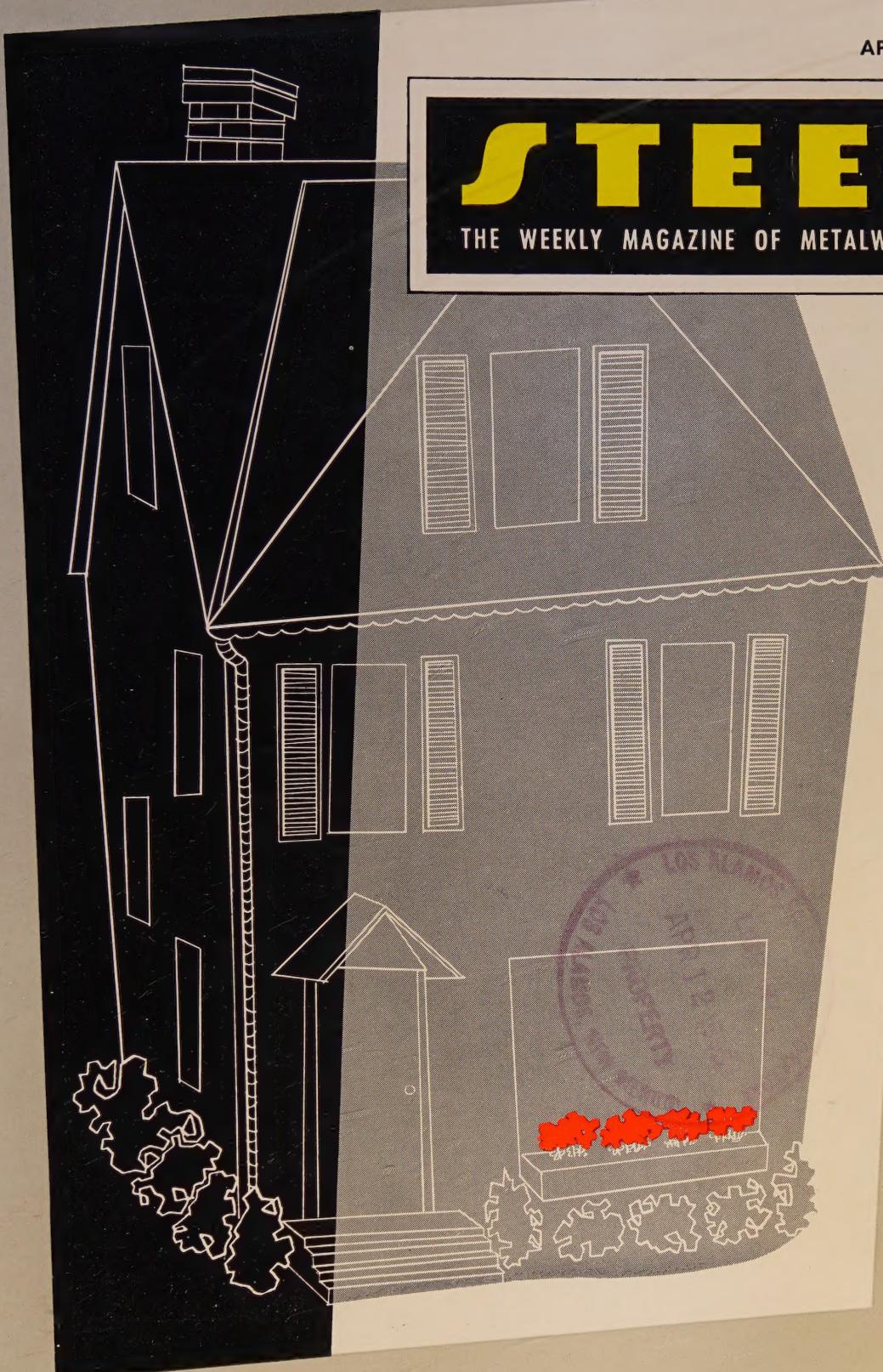


APRIL 11, 1955

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

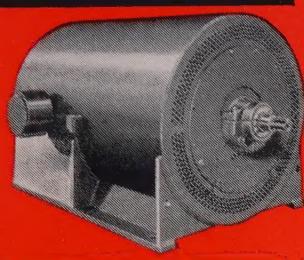


**Takes a heap of metalworking
to make a house a home . . . page 65**

ALLIS-CHALMERS
Large
MOTORS

Choose the Exact Motor You Need

INDUCTION



Tube-type TEFC
squirrel-cage motor

Performance Characteristics

Single or multi-speed. Wound-rotor design for variable speed operation. Available with low starting current, high starting torque and other special characteristics.

Protection

Open; drip-proof; splash-proof or weather-protected; enclosed, self or forced-ventilated; totally-enclosed, fan-cooled; totally-enclosed, water-cooled; explosion-proof.

Applications

Fans, blowers, machine tools, pumps, material handling and auxiliary equipment, compressors, m-g sets, general purpose use. Wound-rotor for variable speed where speed range is not too great.

SYNCHRONOUS



Drip-proof synchronous

Performance Characteristics

Constant speed under all load conditions. Excellent for low speed. High efficiency under all loads. Unity or leading power factor.

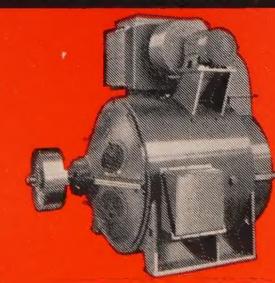
Protection

Open; drip-proof; splash-proof or weather-protected; enclosed, self or forced-ventilated; totally-enclosed, fan-cooled; totally-enclosed, water-cooled; explosion-proof.

Applications

Can be used for almost any type of constant speed drive. Frequently used where power factor correction is necessary.

DIRECT-CURRENT



Force-ventilated dc motor

Performance Characteristics

Stepped or stepless wide range speed variation. Reversing or non-reversing. Dynamic or regenerative braking.

Protection

Open; protected; drip-proof; splash-proof; forced-ventilated from attached or separate blower; enclosed, water-cooled.

Applications

Rolling mills, processing lines, wire mills, machine tools, and other machines requiring wide range of speed adjustment with constant and variable torque and horsepower.

BECAUSE ALLIS-CHALMERS BUILDS A COMPLETE LINE of motors for the metal industries, you can select exactly the performance characteristics and protection you need.

For more information or for engineering assistance, call your nearby A-C District Office or write for bulletins on motors you need. Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4571



**Send for this free
engineering information:**

Open motors
Larger sizes
05B7542 51B7693
05R8123 05B7771

Open motors
NEMA sizes
51B6210

Enclosed motors
Larger sizes
05B7150 05R8189
05B7682

TEFC motors
NEMA sizes
51B7225
51B7286

Synchronous
motors
05R8123 05B7648
05B7649

Direct-current
motors
05B6002

ALLIS-CHALMERS



Bracing for Golden Gate Bridge Fastened with High-Strength Bolts

Taken hundreds of feet above the waters of the Golden Gate, this photograph shows workers using a torque wrench to check the applied tension on one of the Bethlehem High-Strength Bolts connecting a gusset plate to a diagonal in the new bottom lateral system for the Golden Gate Bridge.

This new lateral system, extending the full length of the bridge, ties in with the east and west bottom chords to increase the torsional stiffness of the structure. It was installed by Judson Pacific-Murphy Corporation, and consists of 4700 tons of fabricated structural members, joined to the

original steelwork with 190 tons of Bethlehem High-Strength Bolts.

High-strength bolts were specified by the design engineers because of their ease of installation. With no unduly bulky equipment being required, the work could proceed smoothly, even during periods of high winds, resulting in a cost saving through reduced erection time.

Bethlehem High-Strength Bolts are readily installed. With two hardened washers used on each bolt—one under

the head, the other under the nut—the bolt head is grasped with a holding wrench, where necessary, while the nut is tightened to predetermined tension with a calibrated pneumatic impact wrench. It's as easy as that!

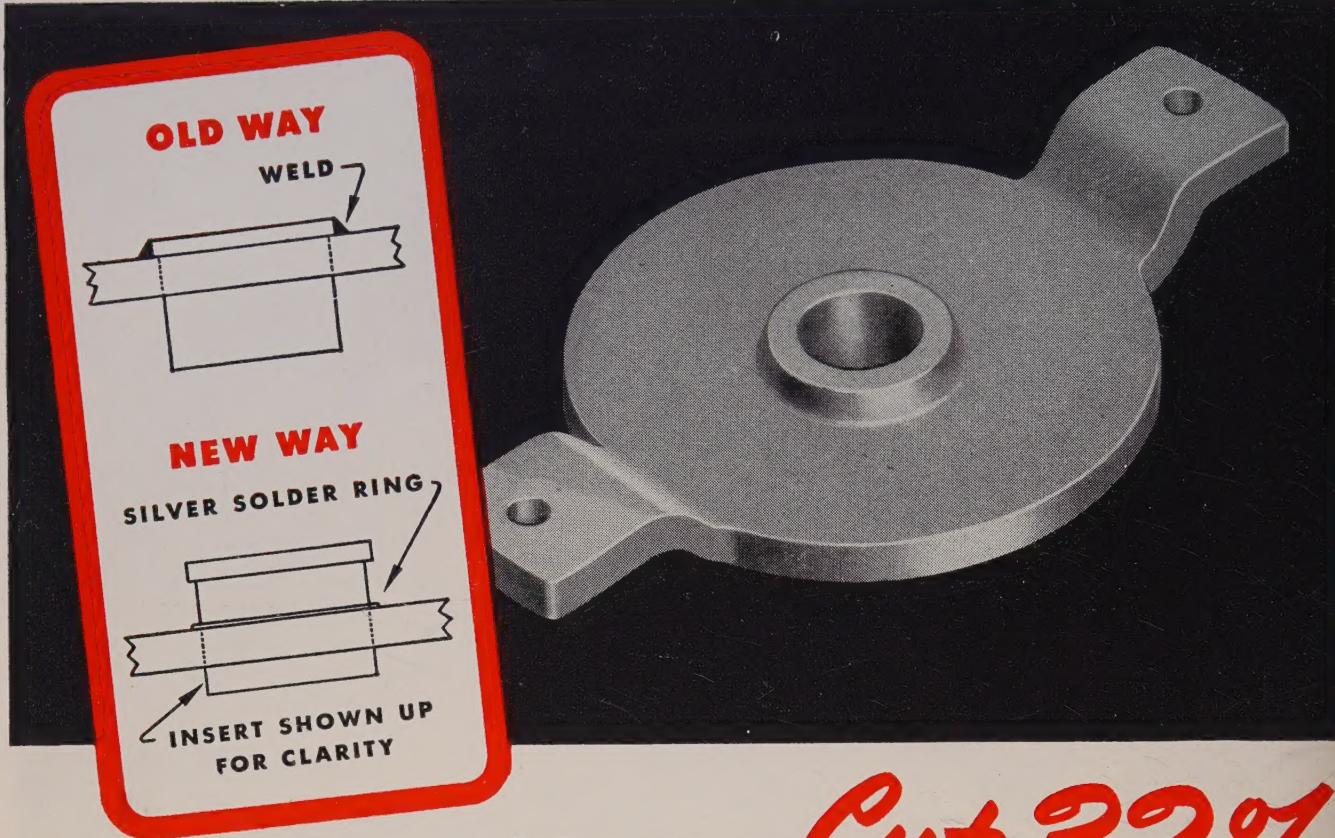
We have an interesting illustrated booklet, "High-Strength Bolting for Structural Joints." Send for a copy.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

*On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corp. Export Distributor:
Bethlehem Steel Export Corp.*

BETHLEHEM STEEL





Assembly Cost Cut 32% with TOCCO* Induction Brazing



Now's the time to balance YOUR production budget

This assembly may bear no resemblance to your product, but its case is typical of the savings accomplished by Induction Heating of metal parts of all sizes and shapes.

Formerly the Norris Thermador Corpora-

tion used arc welding to join the bushing and clamp shown above. In an effort to reduce costs TOCCO Induction Heating was brought into the production picture with the following results:

OLD METHOD (Arc Welding)

Material (rod)	\$ 4.56 per M parts
Labor.	20.63 per M parts
Overhead	<u>21.25</u> per M parts
Total Cost Old Method . . .	\$46.44 per M parts

NEW METHOD (TOCCO Induction Brazeing)

Material (solder and flux) . . .	\$13.83 per M parts
Labor.	8.82 per M parts
Overhead	<u>9.08</u> per M parts
Total Cost TOCCO Method . . .	\$31.73 per M parts

TOCCO Engineers are glad to survey your operations for similar cost-cutting results—no obligation, of course.

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today

NEW FREE
BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. S-4, Cleveland 1, Ohio

Please send copy of "Typical Results of TOCCO Induction Brazeing and Soldering."

Name _____

Position _____

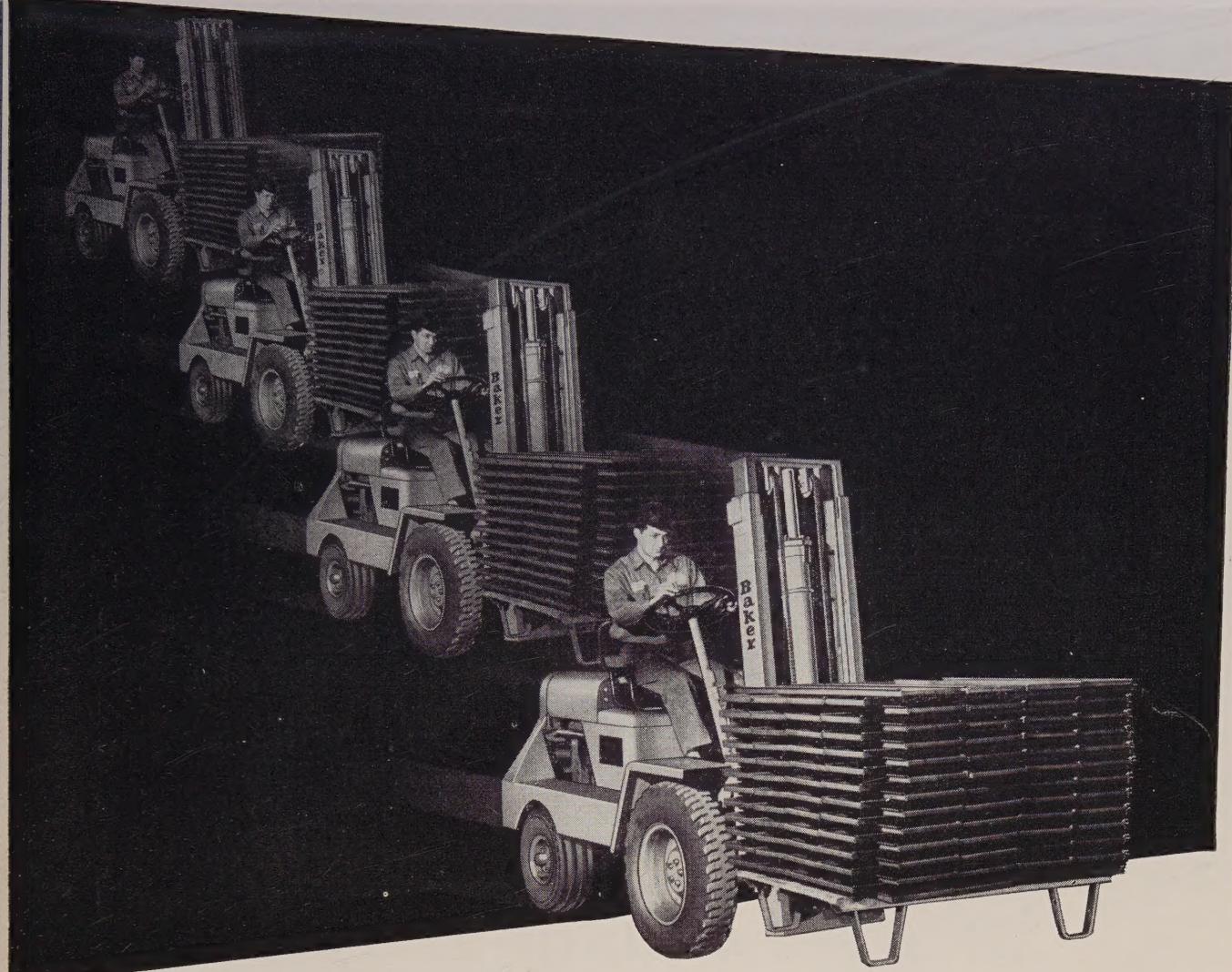
Company _____

Address _____

City _____ Zone _____ State _____



*Trade Mark Reg.
U. S. Pat. Off.



BAKER "Yardloader" ...has 4 forward speeds

This rugged 4000-lb. capacity pneumatic-tired, gas-powered fork truck is the lowest priced in its class. Yet it has many features enabling it to do a greater variety of jobs, faster and more efficiently, than higher priced machines.

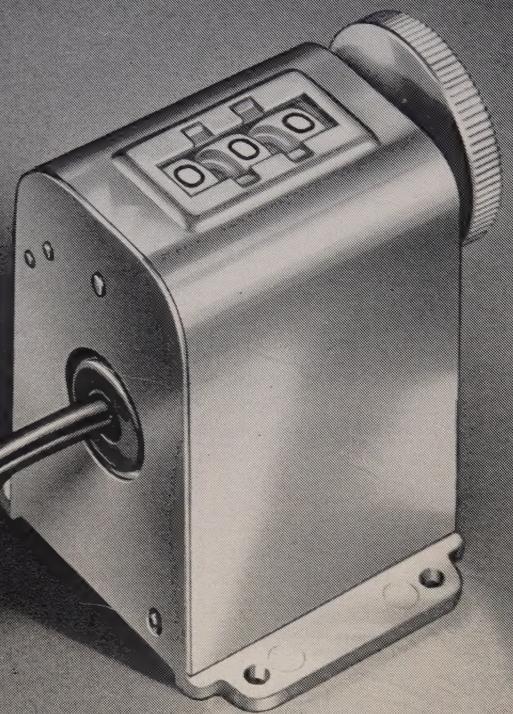
For example: *four* forward speeds give it faster acceleration, faster "cycling", faster delivery on long hauls, better ramp operation and better traction on uneven, soft or slippery surfaces. Add to this the advantages of its large (7.50 x 16) hi-flotation drive tires, higher ground clearance, greater stability (55-inch wheelbase, 41-inch wheel tread), top forward speed of

13.88 miles per hour—and it's not hard to see why "YARDLOADER" is setting new performance records on in and out-of-doors jobs.

All this at a low cost permitting savings up to \$500 and more on initial investment! Write for descriptive bulletin 1345-A. The Baker-Raulang Company, 1259 West 80th Street, Cleveland, Ohio.

Baker
handling equipment

5 GY-1



Born for

"The
Quiet Life"

...this New Magnetic Counter

Added Evidence
that—

Everyone Can Count on
VEEDER-ROOT

For moderate counting duty, where extreme long life is not required, this new small reset counter is completely reliable. Compact and easily connected, this counter may be actuated by any type of switch, relay or photoelectric unit. Recommended speed is 700 counts per minute. Power consumption is low . . . and so is the

price . . . but still the same Veeder-Root high quality. So here again is proof that you can count on Veeder-Root for any type of counter . . . electrical, mechanical or manual . . . for any type of duty in any field from atomics to electronics. What do you need to count?

Write:



Chicago 6, Ill. • New York 19, N. Y. • Greenville, S. C.
Montreal 2, Canada • Dundee, Scotland
Offices and Agents in Principal Cities

"The Name that Counts"

VEEDER-ROOT INCORPORATED
HARTFORD 2, CONNECTICUT

**This Week in
Metalworking**



Vol. 136 No. 15 April 11, 1955

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Editorial, Business Staffs—16. Advertising Index—178. Editorial Index available semianually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.



SEYMOUR

MAKES

Top
Quality
Brass
in Quantity

Seymour has long been famous as a producer of precision quality Brass suitable for select users.

Now Seymour offers the same top quality brass in a wider range of sizes and tolerances to ALL industry.

With new, modern production facilities, Seymour is now prepared to fill QUANTITY ORDERS of top quality brass in sheet, strip and wire form.

Remember...
"You can save more with Seymour's top quality brass".

Seymour also makes...
NICKEL SILVER • PHOSPHOR BRONZE • WELDING RODS • NICKEL ANODES • BRIGHT NICKEL for Plating.

THE SEYMOUR MFG. CO.
SEYMOUR, CONN.

HERE'S NEWS FOR IRON FOUNDRYMEN!

7 big improvements made available
to industry by HANNA, best known
name in iron . . .

HANNATEN

THE IRON INGOT WITH THE NEW SHAPE

FOR USERS OF 10-LB. PIGS



- NO FREE-CARBON POCKETS
- FINER GRAIN STRUCTURE
- MORE EVEN MELTING
- MORE ACCURATE CONTROL
- EASIER CHARGING BY COUNT
- LESS BREAKAGE
- EASIER HANDLING

Available in all grades and extra-close-grain
HannaTite. (Standard 38-lb. pigs also available.)

THE HANNA FURNACE CORPORATION

Buffalo • Detroit • New York • Philadelphia

Merchant Pig Iron Division of

NATIONAL STEEL CORPORATION

behind the scenes



Pour Metals Into Housing

*This old house is gettin' shaky,
This old house is lookin' glum;
Pears the man who up and drawed it
Couldn't seem to make it plumb.*

The principal function of the remarkable house on this week's cover is to call attention to Chicago editor Bill Dean's report on the amount of metalworking that goes into housing. It will be seen from the figures that it takes a heap o' metalworking to make a home, friends, and if by some chance you happen to be associated with the metalworking industry, the statistics Bill has assembled should fascinate your sales manager.

STEEL artist Tom Bryan conjured up the house cover, and—there's something that illustrates the inadequacies of the English language. Properly, a house could be a roof, or even a coat of paint, but in this instance, we are referring to our magazine's cover design. Tom says that when he thinks about his mortgage his hand wavers, and that's why his drawing looks crooked.

Measuring Steel Money

Facing p. 104, you will find yourself knee-deep in STEEL's 30th Annual Financial Analysis of the Steel Industry. Assistant managing editor Vance Bell masterminded this report, and after he checked the final proofs he disappeared for a few days, carrying a lunch box full of aspirins. In his analysis, he points out that fewer sales dollars were taken in by the steel industry in 1954 than in 1953, yet the industry was able to keep more of them. Another startling anomaly may be noted: Sales dropped 18.9 per cent, but net earnings, compared with 1953 figures, were slightly higher on every dollar. It should make interesting reading for a rainy afternoon.

Misrepresentation?

Many years ago, when we had teeth and corpuscles, we got off a freight train outside of Price, Utah, and slyly entered town afoot. This crafty maneuver confounded the yard bulls, and as a result we strolled about the little town unmolested. We

never heard of Price again until C. E. Beveridge of Helper, Utah, dropped us a note postmarked Price, Utah. Mr. Beveridge works for the Utah Railroad, and he reads this page faithfully, which certainly classifies him as a man of discernment. He enclosed a clipping from a Salt Lake City (Utah) paper describing a dead gunman, whose name suspiciously resembled "Shrdlu;" the rest of it was "rafoyetaoinetaoin." Mr. Beveridge was kind enough to reject the theory that we are dead. We can only hope our employer shares the opinion.

The Case of The Faded Figures

First one in with the answer to the problem of the farmer and the ten trees was Roy A. Sternman, Delta-Star Electric Division, H. K. Porter Company Inc., Pittsburgh. Mr. Sternman drew a star, and then another figure, a sort of a pyramid with two ears.

The problem we present today is a dilly. It was sent in by Hallock C. Campbell, associate director of research, Arcos Corp., Philadelphia. Mr. Campbell writes: "Came across a faded manuscript which might interest your readers. It obviously contained a long division problem, but the figures could not be deciphered, except for the decimal point. There seems to be only one solution possible . . ." and at this point he shows us a solution, which we shall lock in the safe.

Here it is . . . and good luck:

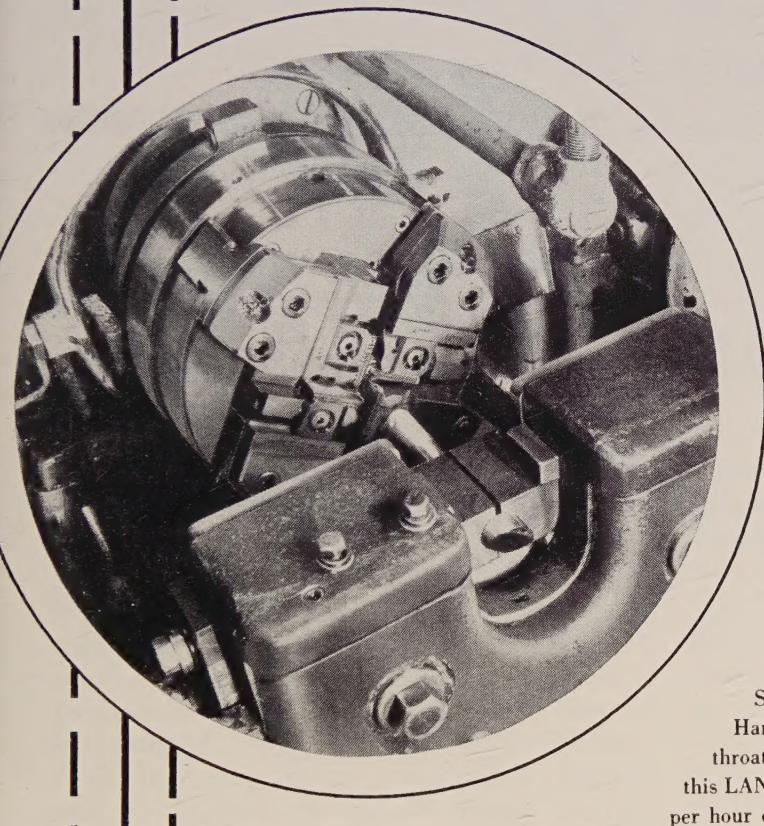
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Shrdlu

BOLTS

threaded to $\pm .001$

on a Landmaco Machine

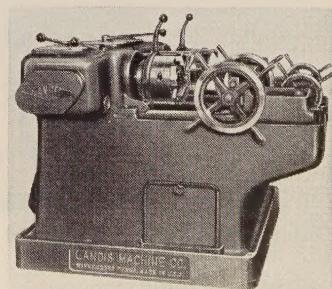


Using LANDIS Threading Equipment, the Chicago Screw Company of Bellwood, Illinois, is able to thread connecting rod bolts to better than Class 4 fit at normal production rates and economical tool cost.

Bolt blanks are of 8640 steel of 30-36 Rockwell "C" hardness. $11/16$ " diameter 16 pitch UN form threads must be cut $1\frac{7}{16}$ " long over a cotter key hole. Specifications required a $\pm .001$ " tolerance on the Pitch Diameter of the thread, and finished threads are closely inspected for concentricity.

To perform this operation a $1\frac{1}{2}$ " LANDMACO Double-Spindle Threading Machine equipped with Leadscrew, Hardened and Ground LANCO Heads, and Chasers of special throat length and hardness was installed. In normal production, this LANDMACO Machine regularly completes 127 threaded pieces per hour cutting at 15 surface feet per minute. On an average 400 threads per head are produced between each regrinding of the chasers.

This installation illustrates the production advantages of LANDIS Equipment for difficult and exacting threading operations. The mechanically-controlled positive feed of the Leadscrew, the maximum rigidity of Die Heads designed for precision threading, and Chasers of special specifications—allow threading hard material with minimum cutting strain. As a result, threads are produced to close tolerances at economical production rates and low tool cost.



For further information, ask for Bulletins H-75 (LANDMACO Machines) and F-80 (Hardened and Ground Heads). Please send specifications when writing.

LANDIS
Machine
COMPANY
WAYNESBORO, PENNSYLVANIA

5 big "TOUCH of GOLD" advantages of NORTON K BOND[†] WHEELS

for your slow speed snagging of gray or malleable iron or non-ferrous metals

1. Faster, freer cutting action
2. Much longer wheel life
3. Less frequent dressing
4. Corners held better
5. Consistent duplication

You can count on Norton K Bond wheels to deliver every one of these money-saving benefits on every slow speed snagging job in your cleaning room—on gray or malleable iron or on non-ferrous metals.

That's because the K Bond is the most radically improved vitrified bond ever developed for these applications. As a result, Norton CRYSTOLON* wheels bonded with it are consistently outperforming and outlasting other wheels.

This has been proved in foundries through the country — on equipment ranging from light portable grinders to heavy swing frames and including floor and bench stands. Here are some typical reports, telling how Norton K Bond wheels add the "Touch of Gold" that cuts cleaning room costs:

- "K Bond wheels increased wheel-life from 80 to 120 hours. Also reduced operator fatigue."
- "Best and fastest cutting wheels ever used."

- "We ground an average of 11,000 more piston rings with K Bond wheels than any wheel formerly used."
- "Excellent performers. Faster cutting and lasted a week longer than other wheels."
- "K Bond wheels lasting 20% longer. Best wheels in our experience."

Test Them In Your Own Foundry

Your Norton Distributor will be glad to arrange a test of K Bond CRYSTOLON wheels in your own plant. Take advantage of this opportunity — get proof of how these revolutionary wheels will grind off more metal per dollar on your slow speed snagging jobs. NORTON COMPANY, Worcester 6, Mass. Distributors in all principal cities, listed under "Grinding Wheels" in your phone directory, yellow pages. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

Making better products... to make your products better

NORTON

and its BEHR-MANNING division

NORTON: Abrasives • Grinding Wheels • Grinding Machines • Refractories

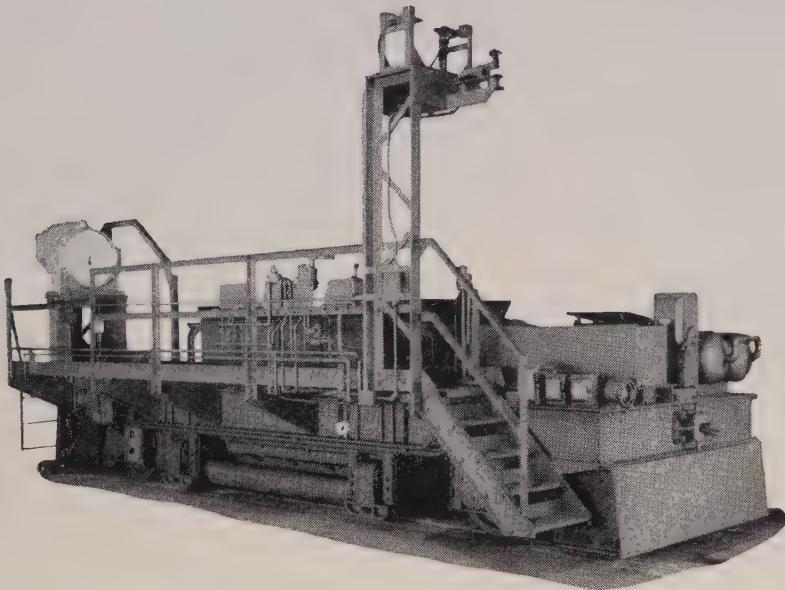
BEHR-MANNING: Coated Abrasives • Sharpening Stones • Pressure Sensitive Tapes

† Patent applied for * Reg. U. S. Pat. Off. and Foreign Countries

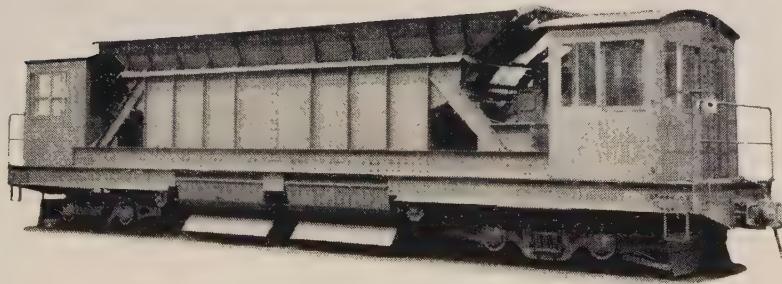


The "Touch of Gold" is job-proved. For slow speed snagging of gray or malleable iron, users report Norton K Bond wheels are far ahead of any others they ever used before. Why not get *your operators' opinions?*

HERE'S built-in STAMINA that spells DEPENDABILITY

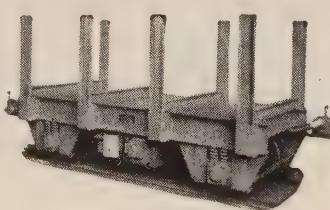


10-TON SCALE CAR, SINGLE HOPPER, BOTTOM DUMP



75-TON ORE TRANSFER, GABLE BOTTOM, SIDE DUMP

Atlas "single-lever" Safety-Type transfers give outstanding short-haul service . . . such as between buildings, for cross-bay crane service, and movement in production. Powered to meet your operating needs . . . storage battery, diesel or gas-electric, or cable reel.



Request "Walk-Along" Bulletin 1283



THE ATLAS CAR & MFG. CO.

ENGINEERS

MANUFACTURERS

1140 IVANHOE RD.

CLEVELAND 10, OHIO, U. S. A.

LETTERS TO THE EDITORS

Eyebrow Flexing



We are disturbed by the article, "Springs Bounce Back in '55" (Feb. 21, page 45). It implies that New England was simply the cradle of springmaking, that most of the springmaking volume is now in the midwest. You can see how this caused some raised eyebrows.

Warren G. Davis
The Davis Press Inc.
Worcester, Mass.

• While it may be possible to read in this inference, the article did say that the industry's growth is now focused in the Midwest—perhaps because a large share of metalworking is in the same area.—ED.

Timeliness is Praised

Your article, "Revolution in Rectifiers" (Mar. 21, page 116), was well done. It has been called to the attention of our industrial people to keep them abreast of developments.

Use of rectifiers in industry, as well as large commercial installations, has been increasing. Your article is timely.

In our operations, we have had several meetings with people from Westinghouse and General Electric on germanium rectifiers. We plan another for our industrial people soon.

R. W. Wyman
manager, industrial sales
Cleveland Electric Illuminating Co.
Cleveland

Steel Warehouse Story

Would you please send me any statistics, pamphlets or articles that deal with the function of the steel warehouse and its present position in the industry today?

A. W. Schmidt
assistant manager
Market Research Department
Wickwire Spencer Steel Division
Colorado Fuel & Iron Corp.
New York

• We suggest you write the American Steel Warehouse Association Inc., 442 Terminal Tower, Cleveland, O. That association should be in a better position to supply the information.—ED.

Gain in Strength

May we reprint the article, "Extra Strength From Same Analysis" (Mar. 28, page 86), for distribution to our members?

Jehu R. Derrickson
executive secretary
Formed Steel Tube Institute
Cleveland

• Permission granted.—ED.

(Please turn to page 12)



You get demonstration
of your work
and complete job
development record

Cone submits samples
of your work

Cone makes
recommendations

You send print
to Cone

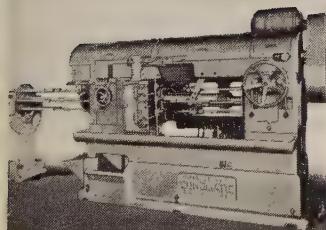
There is no adequate compromise with efficient production practices, if you are in business for a profit.

But you don't always know just how competitively efficient your equipment is. Case histories of what the other fellow is doing are sometimes garbled. At least the poor ones are not advertised. And conditions vary in all plants. Sometimes you have reason to be more concerned with what you don't want in new equipment than with what you do want. Cone believes too much is at stake for a machine to go into a line unequipped for the job, with either carbide or hss tools.

The Conomatic Carbide Development treats each job individually from standpoint of work, machine, tools, and operating personnel.

DATA FOR COMPARISON

Part.....	Bushing	Length.....	5/8"
Machine.....	1 1/8" Conomatic	Hole Dia.....	1 1/4 "
Tools.....	100% Carbide Tipped	RPM.....	825
Material.....	8620	Time.....	14.8 Secs.
Stock Size.....	1 5/8 "		



Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U.S.A.

For
particulars
send for
"Four Steps With Cone"

LETTERS

(Concluded from page 10)

Tax-Wary Expansion



The article, "Out-of-State Taxes Trap Unwary" (Feb. 14, page 44), mentions a booklet, "Corporate Tightrope Walking." Where can we contact the Corporation Trust Co. regarding this booklet?

H. B. Quick
general sales manager
Lemlar Mfg. Co.
Los Angeles

- Write it at 120 Broadway, New York 5, N. Y.—ED.

Movement of Metalworking

The article, "Metalworking Moves Into Southeast" (Feb. 28, page 65), is of great interest.

It was fine of you to publicize what is happening here. We believe the possibilities are great for growth. As a matter of fact, we have a large number of metalworking prospects now.

Dallas T. Daily
chief development engineer
Department of Conservation and Development
State of North Carolina
Raleigh, N. C.

Peer Beyond Price

We would like to have six tear sheets of the article, "Peer Beyond the Purchase Price" (Mar. 21, page 175).

J. R. Fulton
Wheelock, Lovejoy & Co., Inc.
Cambridge, Mass.

- Sent.—ED.

Shopping for Cars

Have you recently published a table on the prices, specifications and costs of accessories on four-door sedans? Such a table was published on page 68 in the Feb. 23, 1953, issue.

We have heard so much about improper pricing of automobiles. Right now we have different prices from two sources. We need authentic information, such as STEEL's 1953 table.

J. H. Gepfert
Reeves Pulley Co.
Cleveland

- Up-to-date tables were in the *Mirrors of Motordom* column. Tear sheets of the 1955 table (Dec. 6, 1954, page 88) and 1954 table (Feb. 8, 1954, page 82) have been forwarded.—ED.

Problem Unmasked

We would appreciate a copy of the article "Masking Problems Eased" (Feb. 21, page 100).

A. F. Podesta
sales manager
Metal Division
National Lead Co.
New York

- Sent.—ED.



WE'RE RIGHT "NEXT DOOR" IN TERMS OF SERVICE!

... and when you want stainless steel screws

or high-tensile alloy fasteners . . . standard or special . . . try FERRY service.

You would expect the "world's leading manufacturer of stainless steel screws" to have an edge in quality and service;

WE HAVE.



The **E. W. FERRY**
SCREW PRODUCTS Inc.

Smith Road, Brookpark, Cleveland 30, Ohio



*The man who needs a new
machine tool and doesn't buy it -
is paying for it anyway...*

in extra operations

INDUSTRY lives with a continuing demand for higher performance and smoother, trouble-free operation of its products. Hence the need for closer tolerances and higher precision of parts, usually achieved through added production line operations and attendant higher costs.

Offsetting this trend toward added operations, Microhoning brings profitable relief. This unique process of controlled abrading can often replace two or more machining operations. Microhoning thus not only removes stock and generates geometric accuracy, but also insures dimensional precision and develops desired functional surface finish—all in one simple, automatic operation.

Why not analyze your processing operations to see how Microhoning—the machining process of multiple benefits—can eliminate some of the extra operations now causing you headaches and boosting your costs? In extra operations you may be paying right now the price of the new Microhoning equipment you don't have.

PART:

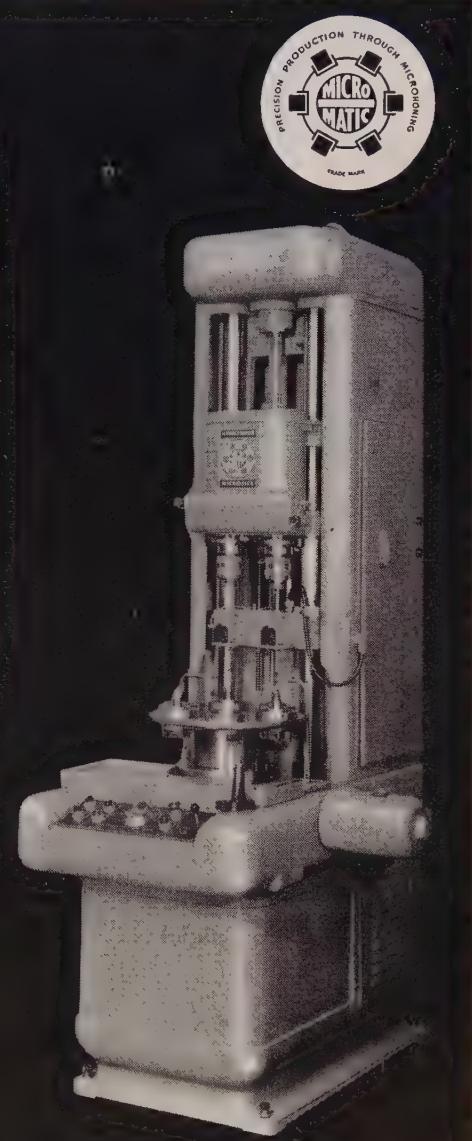
Diesel Fuel Injector Body. Long, small diameter bore must be straight and round.

PROBLEM:

To reduce high cost of operations required to generate accuracy.

SOLUTION:

Microhoning—Three operations replace six—size held to .000090 inch, finish 8 to 12 Microinches r.m.s.



*MICROHONING = STOCK REMOVAL + GEOMETRY + SIZE CONTROL + SURFACE FINISH

MICROMATIC HONE CORPORATION

8100 SCHOOLCRAFT AVE., DETROIT 38, MICHIGAN

MICROMATIC HONE CORP.	MICROMATIC HONE CORP.	MICROMATIC HONE CORP.	MICROMATIC HONE LTD.	MICROMATIC HONE CORP.
MICRO-MOLD MFG. DIV.	2205 Lee Street	1535 Grande Vista Avenue	330 Grand River Avenue	MICRO-MOLD MFG. DIV.
Boston Post Road	Evanston, Illinois	Los Angeles 23, California	Brantford, Ontario, Canada	231 So. Pendleton Avenue
Guildford, Connecticut				Pendleton, Indiana

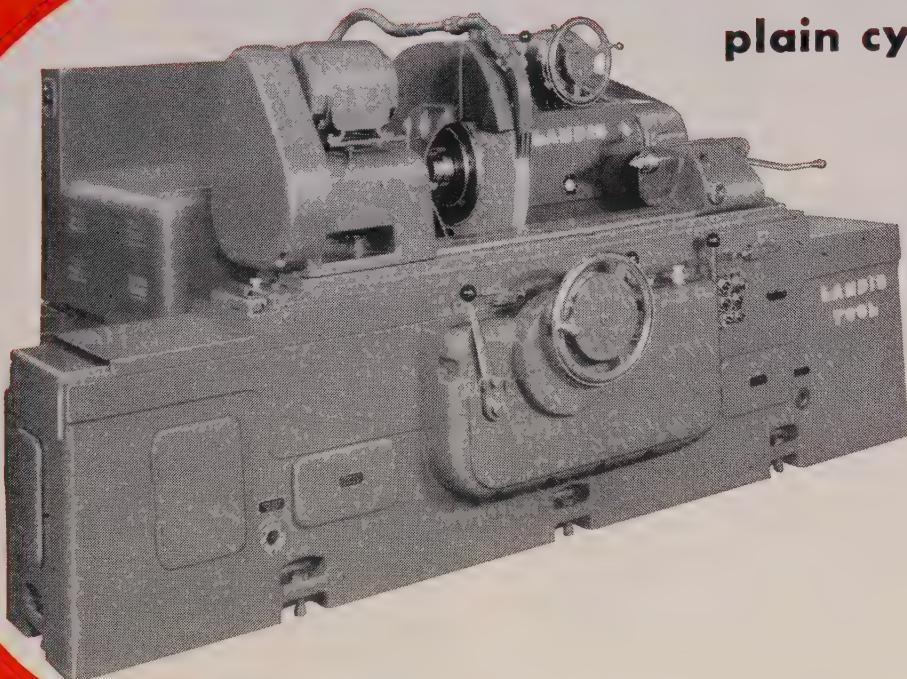
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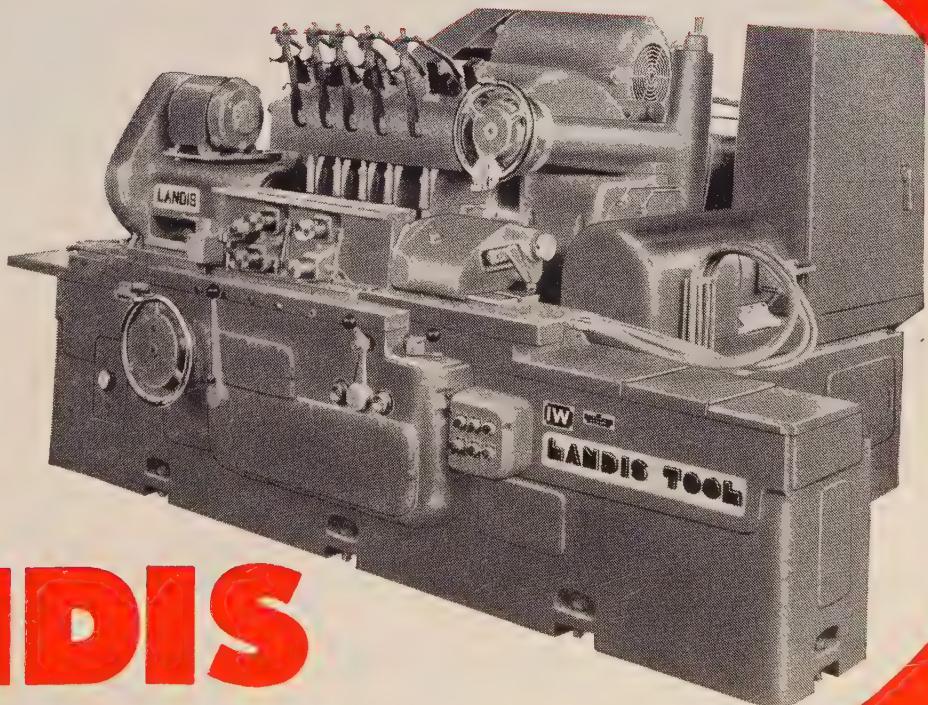
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For tool room, job shop or moderate production on a wide variety of cylindrical parts. Does straight, taper, internal and face grinding operations. Available in 10" to 48" swings with lengths from 24" to 120".



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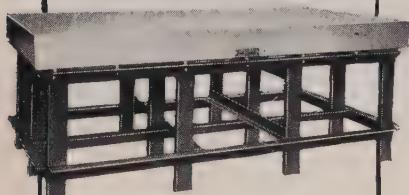
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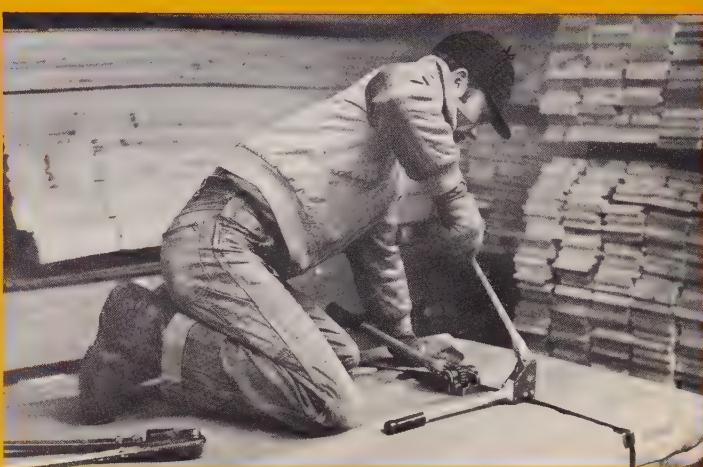
Acme Steel Strapping and Wire Stitching protect ranges from damage—reduce weight and shipping costs. (Idea No. 434)

Skidding of motors, tightly held by Acme Steel Strapping, save space and time in handling. (Idea No. 443)



Acme Steel Strapping holds gypsum board in bundle to insure safe transit of prefabricated house. (Idea No. 442)

Securing waterproof paper wrapper, with Acme Steel Strapping, for outside storage of "dry" lumber. (Idea No. 441)



AIM* to stop damage in materials handling

Acme Steel Strapping and Wire Stitching *ideas in action* prove that there are safe, sure, low-cost methods to prevent costly, unnecessary damage in moving materials.

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ABOVE: Acme Steel Strapping holds felt insulation strip and wire mesh screen to back of clothes dryer. (Idea No. 440)

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- Idea #417—Unitizing heavy, shaped timbers
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- Idea #123—Self-palletizing unit of concrete block
- Idea #437—Strapping and palletizing hydraulic brake drums
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- Idea #402—Strapping rolls of tire cord fabric for overseas shipping
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- Idea #109—Bundling and truck loading beehives
- Idea #133—Tying protective wrappings to oxygen cylinders
- Idea #408—Packaging of impregnated pipe
- Idea #107—Carload bracing coiled copper rod
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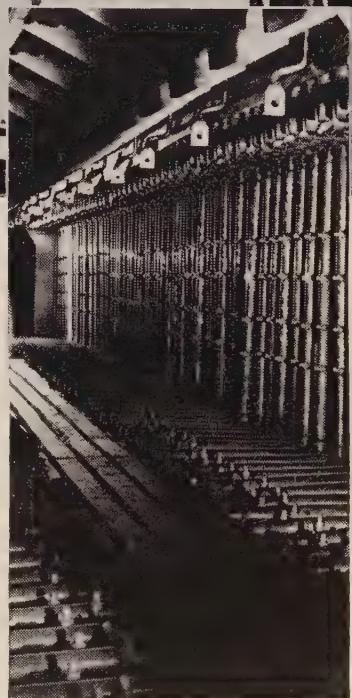
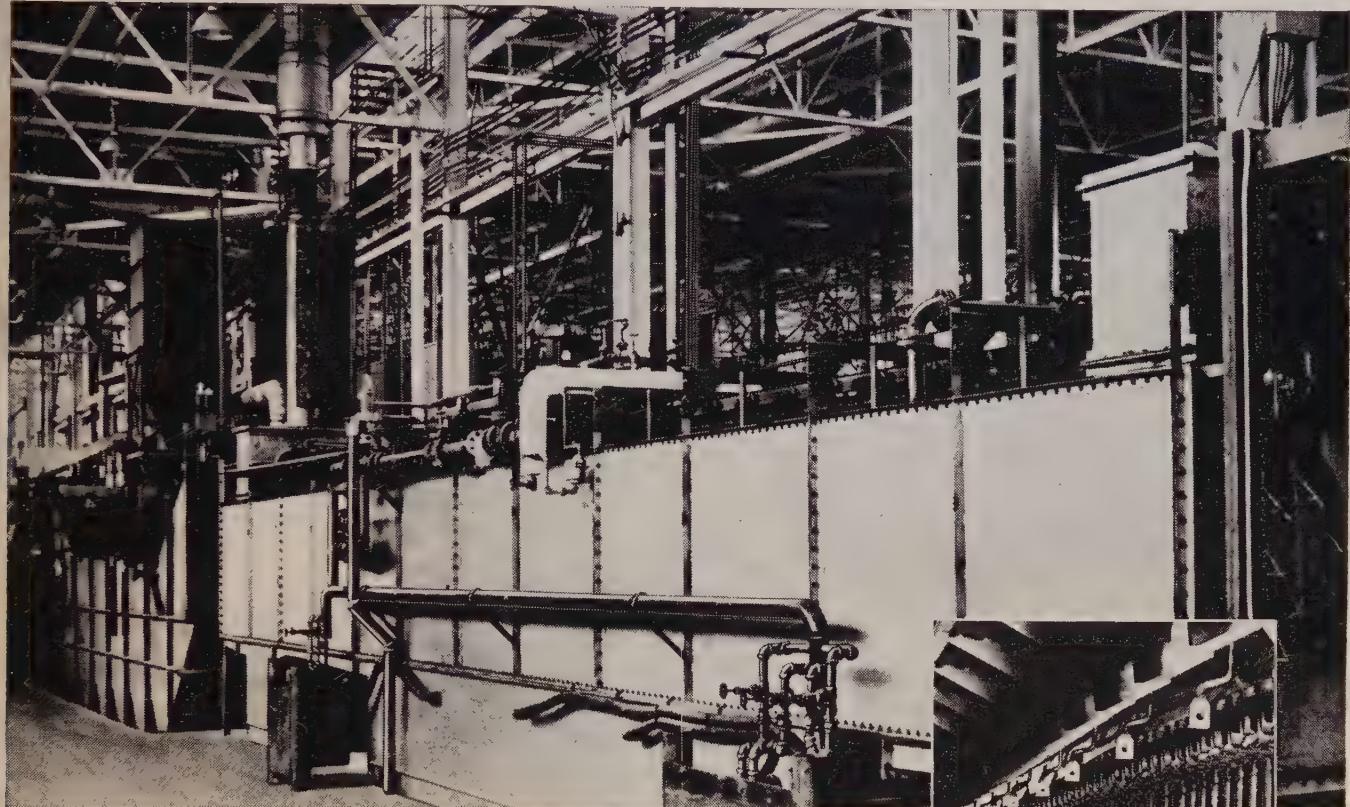
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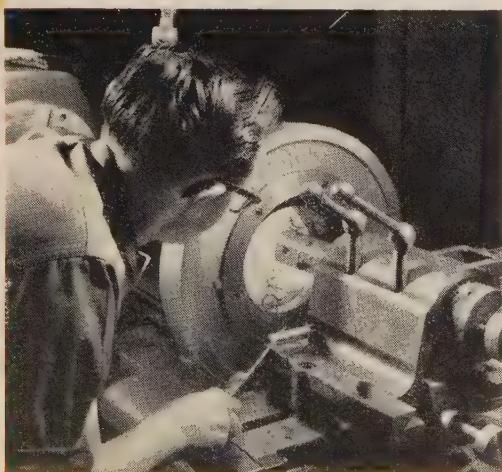
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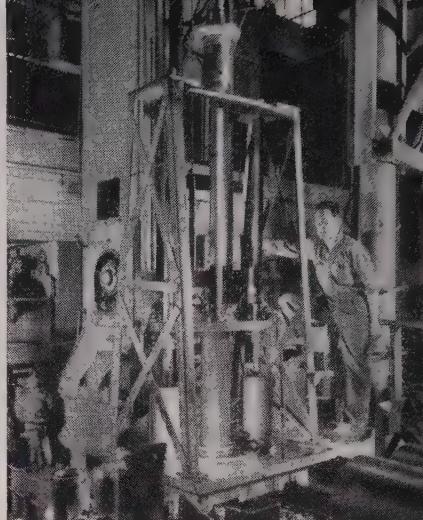
1. Welding The Main—Fittings and base plate are welded into the base of an oil hydraulic cylinder. The steel tubing must make a sound weld without warping.



2. Machining The Main—High speed threader (235 rpm) cuts close tolerance threads on the inside diameter for bronze packing nut and steel stop ring. Snug fit is essential to add strength to cylinder and prevent leakage under pressure.



3. Turning The Sleeve—The outside diameter of the sleeve is turned, and then ground to even finer finish. Straightness and concentricity in the tubing is most important. Proper stress-relief annealing of the steel prevents warping.



4. Honing The Sleeve—On this vertical honing machine, the inside of the sleeve (center) is finished to a 16 micro-inch finish for piston-ring fit to contain the hydraulic pressure when cylinder is operating.

How Strong

G

In order to increase production and reduce costs, all industry today is demanding greater performance from its tools. Equipment must carry heavier loads, lift them higher and faster—stay in service longer than ever before.

To accomplish this, strong, powerful arms of steel in the form of oil hydraulic cylinders are being used increasingly on industrial equipment, machinery, tractors, earth movers, loaders, lift trucks, portable drilling rigs. They transmit power smoothly, economically.

Among the producers of oil hydraulic cylinders, one of the largest and best known is the Commercial Shearing and Stamping Company of Youngstown, Ohio. It has developed precision methods of making heavy duty hydraulic cylinders that operate easily, yet contain the hydraulic pressures without leakage. To make them, Commercial starts with the best in cold drawn seamless mechanical tubing from experienced steelmakers such as Pittsburgh Steel Company.

• **One Example**—Take a look at the way Commercial produces just one of its many models: the two-sleeve telescopic cylinder used to erect the booms of a portable rotary drilling rig.

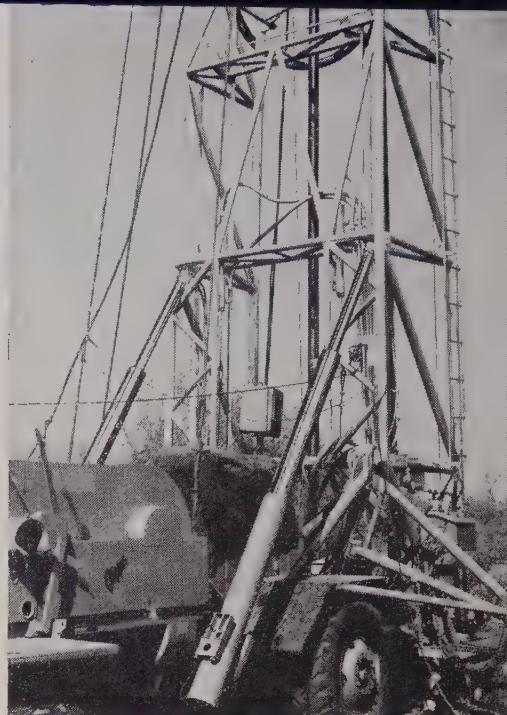
Each rig is equipped with two of



5. Grinding The Plunger—Here is a rigid test for any tubing. The plunger must be turned, ground, and polished to a mirror-like 16 mil with crocus cloth. The slightest imperfection would cause leakage under operating pressure.



6. 100-Per-Cent Inspection—Every cylinder made at Commercial is tested on equipment that develops the full pressure loads that are required under field operating conditions, and is thoroughly inspected during operation.



7. Raising A Rig—The double acting cylinders on this portable Franks rotary drilling rig develop an initial thrust of 35 tons in positioning the boom, and nearly 20 tons of pull when bringing it down. This is one example of the many models of oil hydraulic cylinders produced by Commercial.

Arms of Industry Their Muscles

these cylinders. They have a stroke of nearly 10 feet, providing an initial thrust of 35 tons. This lifts the boom from a horizontal folded position to a vertical extended position. To reverse the operation, the cylinder's double acting feature develops a thrust of nearly 20 tons on the pull stroke.

The tubular parts of each cylinder consist of a main, a sleeve, and a plunger. As the cylinder operates under oil hydraulic pressure up to 1,000 psi, the main provides the base for actuating the sleeve and plunger.

In production, these tubular parts are turned, ground and honed. Fittings are welded into position. Ends are threaded to hold packing nuts and stop rings. From start to finish, all operations require detailed scientific accuracy (see photos).

• What It Takes—You can readily see why the steel tubes for each cylinder must have special properties for this specific application.

Each tube must have uniform close dimensional accuracy, straightness, and concentricity, so that the amount of steel removed in turning, grinding and honing can be kept to a minimum. Extra time on these operations is expensive.

The steel must have machinability.

It can't be too soft or too hard. It must be clean in its chemical composition and clean on the surface. At the same time it has to weld easily. And it must take both machining and welding without warping. Finally, it must have extra strength for the variety of stresses that the load of raising, holding, and lowering the rotary drilling rig boom will place on it in field operations.

The mechanical seamless tubing supplied by Pittsburgh Steel for this cylinder ranges in size from 7.210 inches inside diameter with a wall thickness of .395 inches for the main, down to 3.250 inside diameter with a wall thickness of .313 inches for the plunger. It is a low carbon steel of inherent quality, cold drawn to exact

uniform size for easy machining and honing. It is stress-relief annealed to prevent warpage during manufacture. And it provides a tensile strength of over 60,000 psi.

• What This Means To You—Commercial uses Pittsburgh Steel's seamless mechanical tubing for this and many other types of cylinders because it can rely on excellent performance in production and high quality in the finished product.

If you have an application for seamless tubing, why not look into the opportunities Pittsburgh Steel can offer you? A phone call to the closest district office (see below) will bring prompt personal attention. Why not call today?

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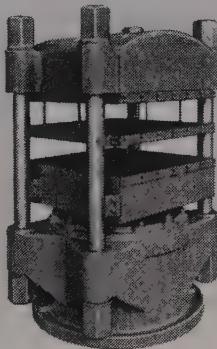
Write for your copy of the color brochure "The New Pittsburgh Steel Company."



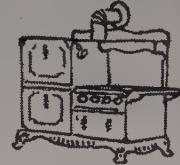
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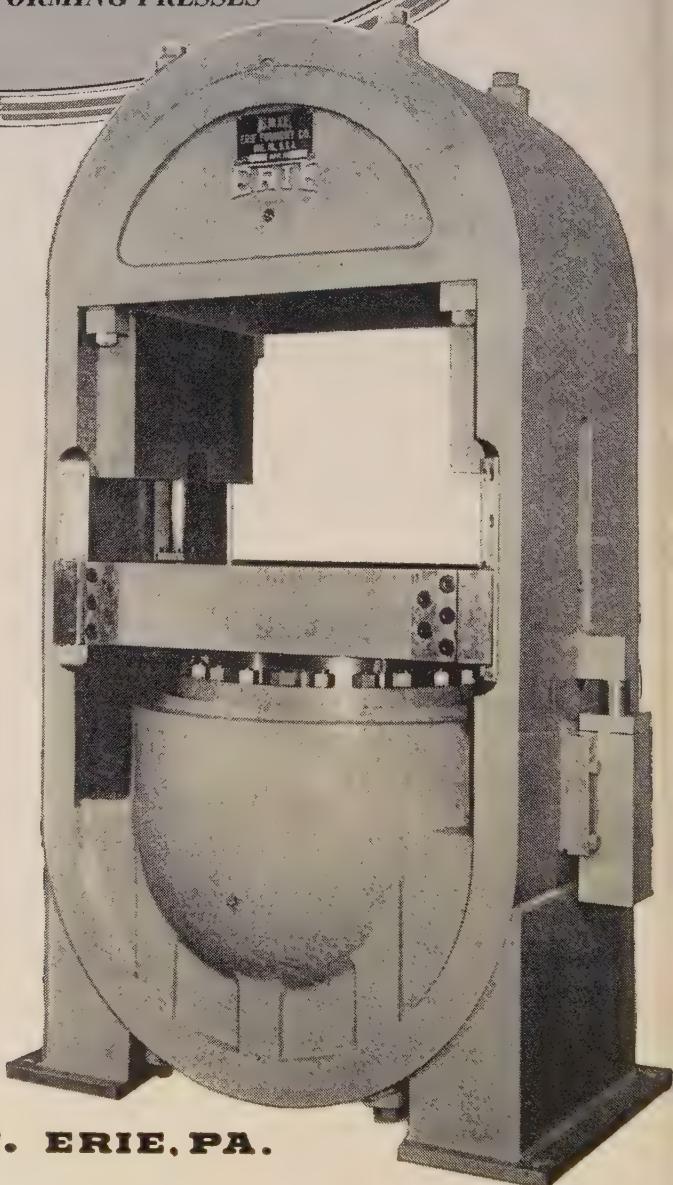
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When minimum deflection (less than .002") means almost perfect die matching . . . almost perfect parts . . .



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How's this for economy? . . . Longer tool life, higher quality work, more output per machine and . . . all at a cost of 8c per gallon of coolant in the machine!

Aside from the fact that Antisep All-Purpose Base out-performs even the most expensive straight oils, its amazing cost savings astonish metalworking men the most.

Even so, it has other features that make it popular with machinists. Like its anti-welding properties on heavy-duty work, and its antiseptic qualities which eliminate obnoxious odors in the shop.

Ask to see the proof of Antisep's performance in metalworking plants—the Houghton Man has plenty to show you. A test can be arranged at your convenience if you write to Metalworking Research Department, E. F. Houghton & Co., 303 West Lehigh Ave., Philadelphia 33, Pa.

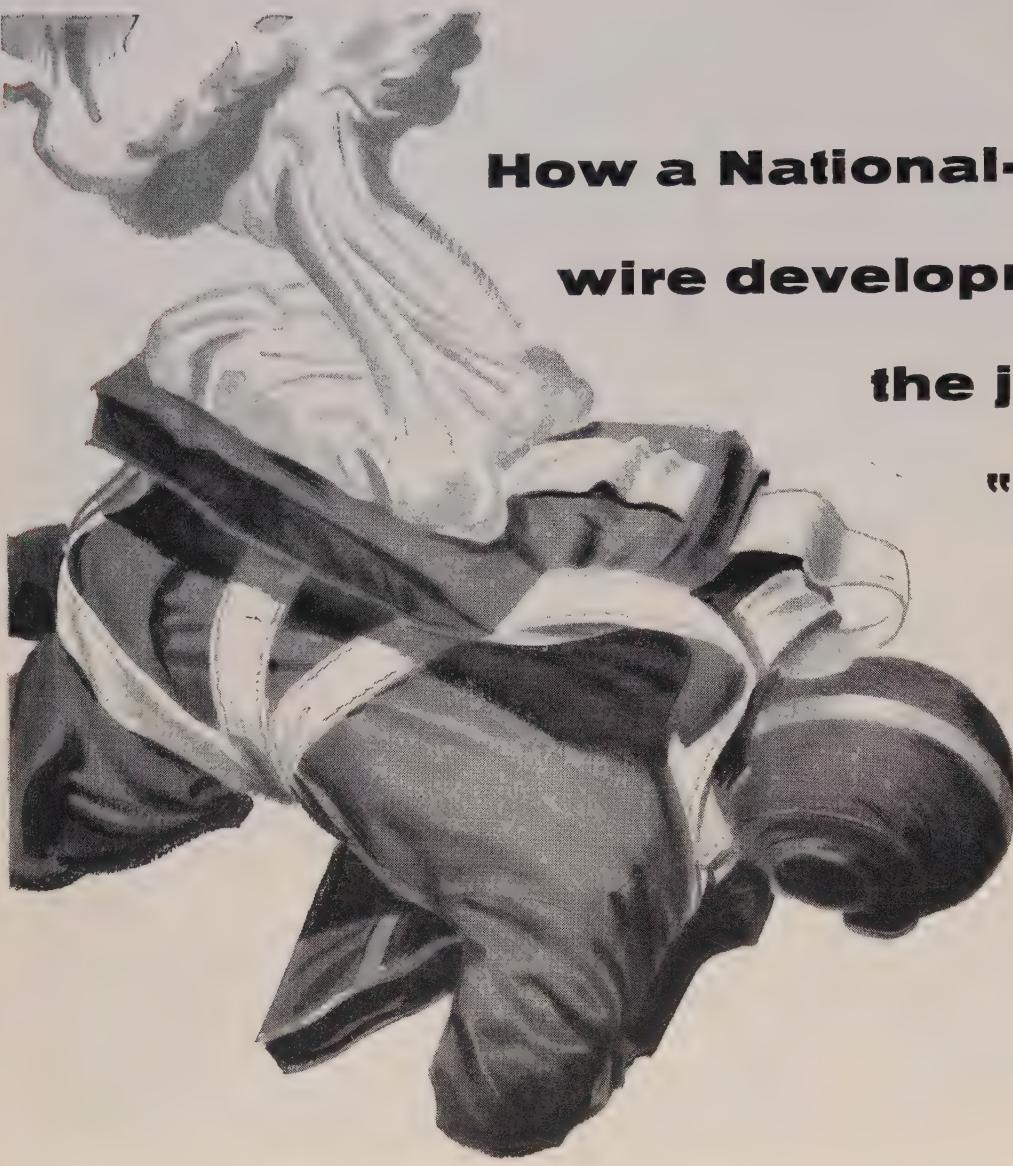
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Our engineers came up with a special stainless steel wire that would take the severe forming stresses created in coiling long, thin springs. In addition, this wire could be made into springs with unusual resistance to permanent set. And, finally, this wire enabled the spring designer to create a spring with high initial tension . . . a sort of delayed action characteristic which prevented the

spring from opening until the severe shock of deceleration was applied.

We solved this problem by staying with it long after most wire and steel makers would have given up. It is this stay-with-it approach that has enabled National-Standard to solve more of the fussy problems in steel and wire making than anyone else in the industry.

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Tire Wire, Stainless, Fabricated Braids and Tape

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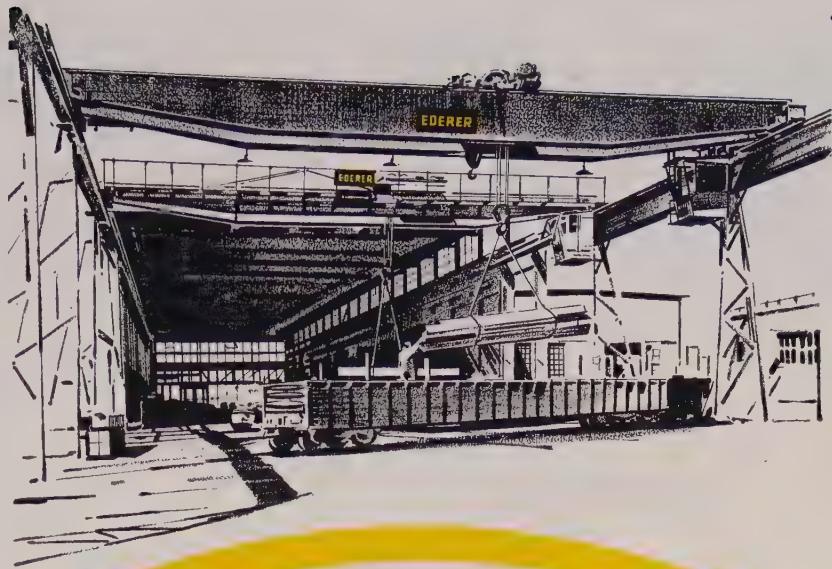
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- Apr. 11-13, Wire Reinforcement Institute Inc.:** Annual meeting, the Greenbrier, White Sulphur Springs, W. Va. Institute's address: National Press Bldg., Washington 4, D. C. Managing director: Frank B. Brown.
- Apr. 11-15, National Association of Manufacturers:** Institute of industrial relations, Bellevue-Biltmore hotel, Belleair, Fla. Association's address: 2 E. 48th St., New York 17, N. Y. Secretary: Noel Sargent.
- Apr. 11-16, Concrete Reinforcing Steel Institute:** Annual meeting, the Greenbrier, White Sulphur Springs, W. Va. Institute's address: 38 S. Dearborn St., Chicago 3, Ill. Managing director: H. C. Delzell.
- Apr. 12-13, Bituminous Coal Research Inc.:** Annual meeting, William Penn hotel, Pittsburgh. Association's address: 803 Southern Bldg., Washington, D. C. Secretary: C. A. Reed.
- Apr. 12-13, Steel Joist Institute:** Annual meeting, the Greenbrier, White Sulphur Springs, W. Va. Institute's address: 1346 Connecticut Ave. N.W., Washington 6, D. C. Managing director: C. H. Luedeman.
- Apr. 12-14, American Gas Association:** Sales conference on industrial and commercial gas, Hotel Statler, Boston. Association's address: 420 Lexington Ave., New York 17, N. Y. Secretary: M. A. Combs.
- Apr. 13-15, American Society of Lubrication Engineers:** Annual meeting and exhibit, Sherman hotel, Chicago. Society's address: 84 E. Randolph St., Chicago 1, Ill. Secretary: W. P. Youngclaus Jr.
- Apr. 13-15, Society of the Plastics Industry Inc.:** Pacific Coast conference, Palm Springs, Calif. Society's address: 67 W. 44th St., New York 36, N. Y. Executive vice president: William T. Cruse.
- Apr. 14-15, Industrial Truck Association:** Spring meeting, Drake hotel, Chicago. Association's address: 526 Washington Loan & Trust Bldg., Washington 4, D. C. Managing director: Wm. Van C. Brandt.
- Apr. 15, Foundry Equipment Manufacturers Association Inc.:** Spring meeting, Sheraton-Carlton hotel, Washington. Association's address: One Thomas Circle, Washington 5, D. C. Executive secretary-treasurer: C. R. Heller.
- Apr. 16-17, Packaging Machinery Manufacturers Institute:** Spring meeting, Palmer House, Chicago. Institute's address: 342 Madison Ave., New York 17, N. Y. Secretary: Helen L. Stratton.
- Apr. 18-19, American Institute of Steel Construction:** Annual national engineering conference, Muehlebach hotel, Kansas City, Mo. Institute's address: 101 Park Ave., New York 17, N. Y. Executive vice president: L. A. Post.
- Apr. 18-20, American Management Association:** Packaging conference, Palmer House, Chicago. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: James O. Rice.
- Apr. 18-20, American Institute of Mining & Metallurgical Engineers:** National open hearth conference, Bellevue-Stratford hotel, Philadelphia. Institute's address: 29 W. 39th St., New York 18, N. Y.
- Apr. 18-20, National Air Pollution Symposium:** Huntington-Sheraton hotel, Pasadena, Calif. Information: Stanford Research Institute, Stanford, Calif. Chairman: Dr. A. M. Zarem.
- Apr. 18-20, Triple Industrial Supply Convention:** Cleveland Public Auditorium, Cleveland. Information: Hunter - Thomas Associates, Keith Bldg., Cleveland 15, O.
- Apr. 18-21, American Society of Mechanical Engineers:** Spring meeting, Lord Baltimore hotel, Baltimore. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: C. E. Davies.
- Apr. 18-21, Society of Automotive Engineers Inc.:** Aeronautic meeting, production forum and aircraft engineering display, Statler and McAlpin hotels, New York. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.



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New! Ball bearing and engineering data! 175 pages full in FEDERAL'S NEW CATALOG! To get your copy, just drop us a line.

THE FEDERAL BEARINGS CO., INC. • POUGHKEEPSIE, N.Y.

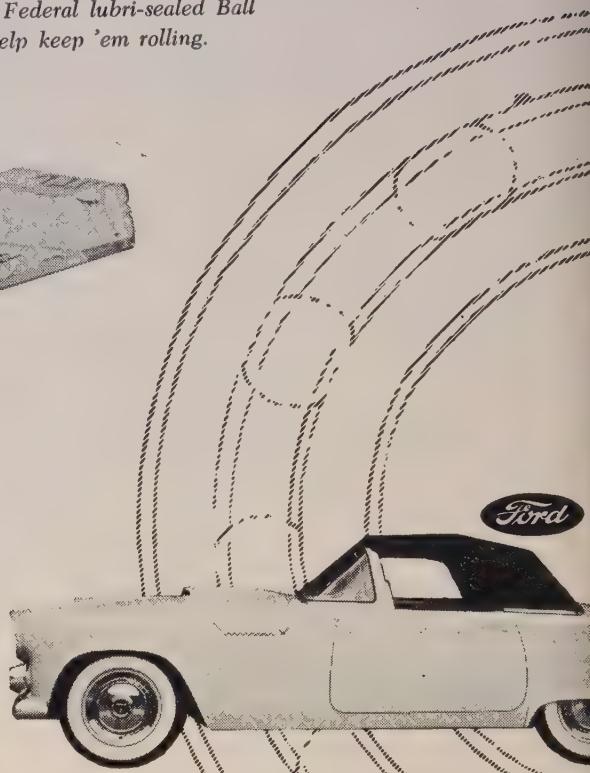
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So much of a car's smooth, quiet running performance and safety depends on its ball bearings! And millions come off the automotive assembly lines, precision-equipped with Federal Ball Bearings.

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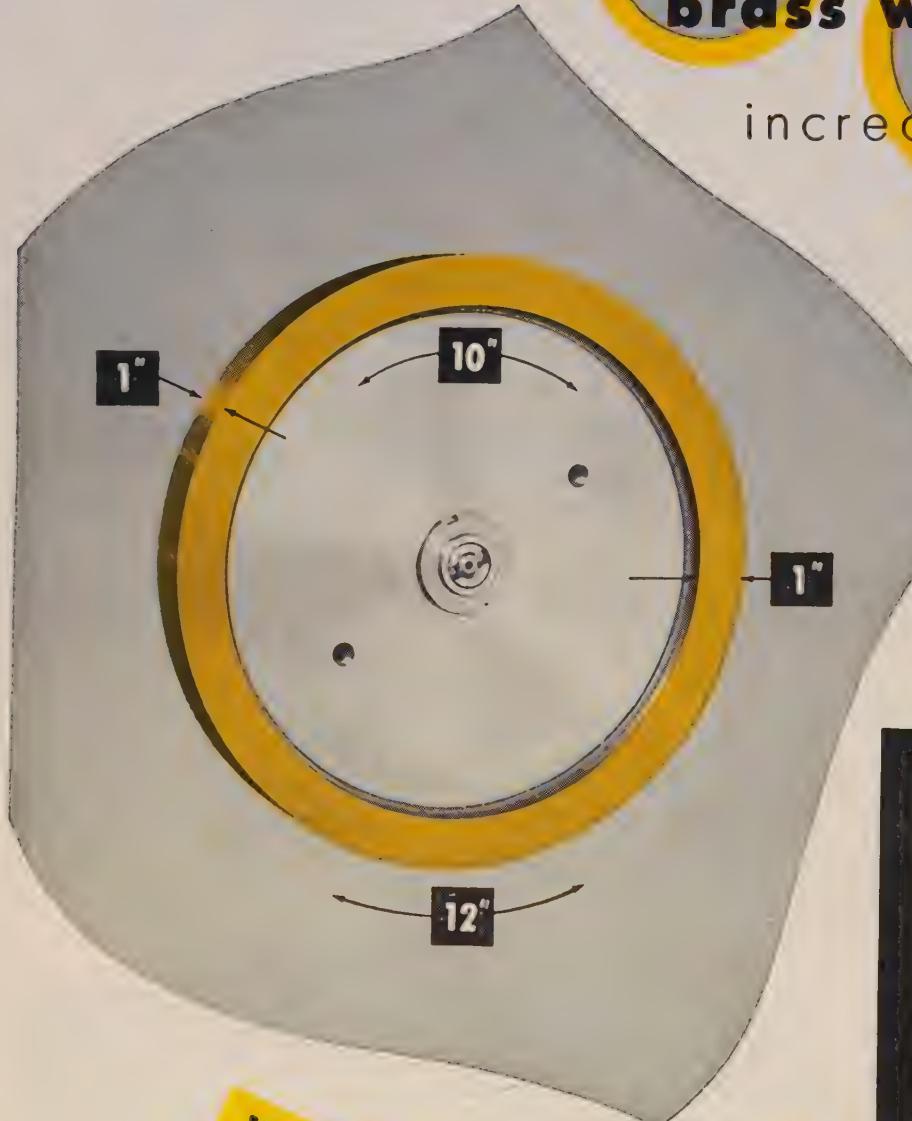
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Du Pont's exclusive combination of stabilizers gives you a solvent with *rugged resistance* to *all* major causes of solvent deterioration—light metal chlorides, heat, light, air and acidic compounds.

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And don't overlook the *extra convenience* of using "Triclene" D—the first truly all-purpose solvent for vapor degreasing. No matter how many different metals you clean, or how many different kinds of parts,—this *one* solvent can do any degreasing job quickly and thoroughly.

The balanced stability of "Triclene" D gives you *extra solvent durability, extra operating economy, extra versatility*. And it costs no more to get this new high in cleaning efficiency!

New All-Purpose

"TRICLENE" D

Trichlorethylene



REG. U. S. PAT. OFF.

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 Please have your representative call with the details.

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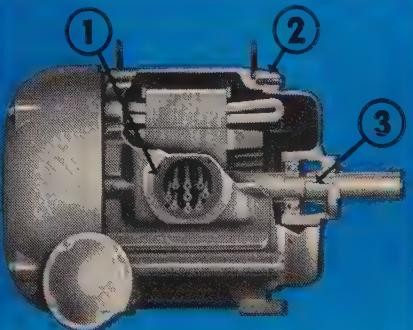
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Giving magnetic dust the brush-off

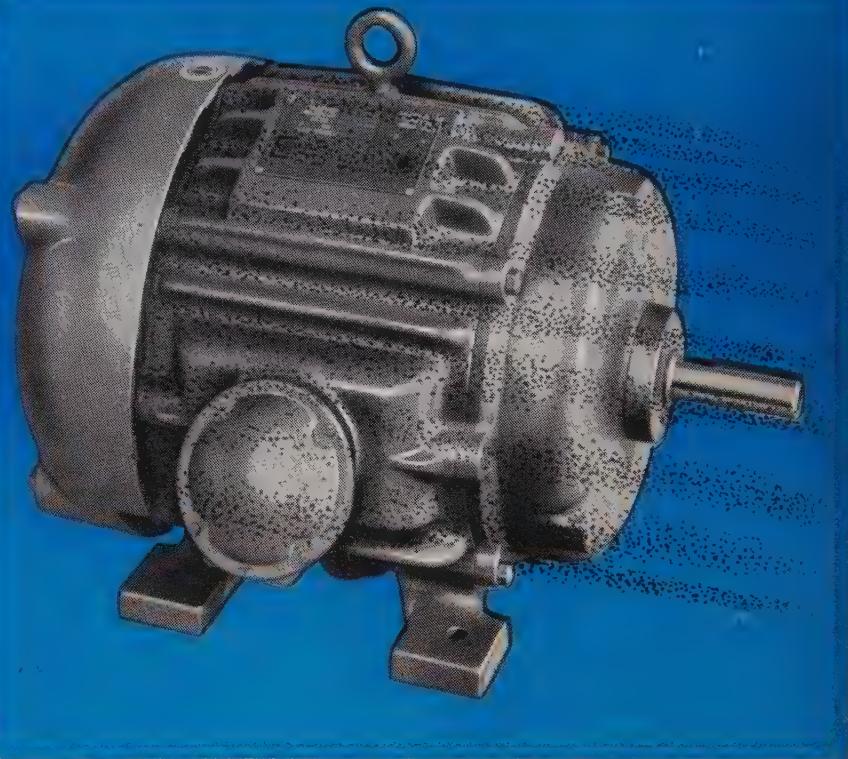


3 BIG PROTECTION FEATURES

1. Leads are sealed with a plastic compound to protect against dust and moisture.

2. Extra long precision fit, plus a mastic sealing compound.

3. Non-ferrous slinger and bushing, sealed with heavy fibrous grease.



ELLIOTT TACONITE-DUST-PROOF MOTOR

This motor will stand up to tough atmospheric conditions such as those produced by the taconite beneficiation process, crushing, mixing, and drying operations, etc., and come back asking for more everytime. It cleans itself while operating—the fan-driven cooling air blast flows over radiating fins to prevent dust lodging on the motor surface. There's no outer casing under which dust can collect. And, after long shut down periods, it's a cinch to brush away collected dust.

In addition to these external features, all windings, bearings and other vital parts are thoroughly protected against dust intrusion. Put this taconite-dust-proof motor to work on your problem conditions and say good-bye to motor trouble.

Ask your local Elliott representative for full data, or write for the descriptive bulletin to Elliott Company, Crocker-Wheeler Division, Jeannette, Pa.

ELLIOTT Company



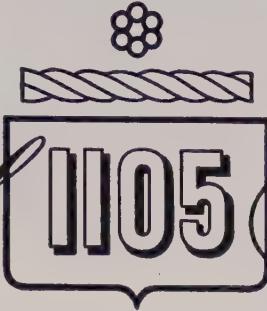
W5-4



TURBINE-GENERATORS TURBINES MOTORS GENERATORS DEAERATING HEATERS EJECTORS CONDENSERS COMPRESSORS TURBOCHARGERS TUBE CLEANERS STRAINERS



ROEBLING ANNOUNCES ITS NEW



Royal Blue

WIRE ROPE... 15% STRONGER THAN
YESTERDAY'S GUARANTEED STRONGEST!

15% MORE STRENGTH is a whopping improvement. But translate that extra strength into terms of increased service life and you've really got something to brag about.

★ What's more, Roebling is pulling no punches on the variety of this new rope that will soon be available. You'll be able to get **ROYAL BLUE** Wire Rope in EVERY DIAMETER from $\frac{1}{4}$ " to $3\frac{1}{2}$ "... in EVERY STANDARD CONSTRUCTION with an independent wire rope core.

★ In addition to new high strength, Roebling type 1105 wire — the finest high carbon rope wire ever produced — gives **ROYAL BLUE** Wire Rope amazing toughness and resistance to impact, crushing, abrasion and fatigue.

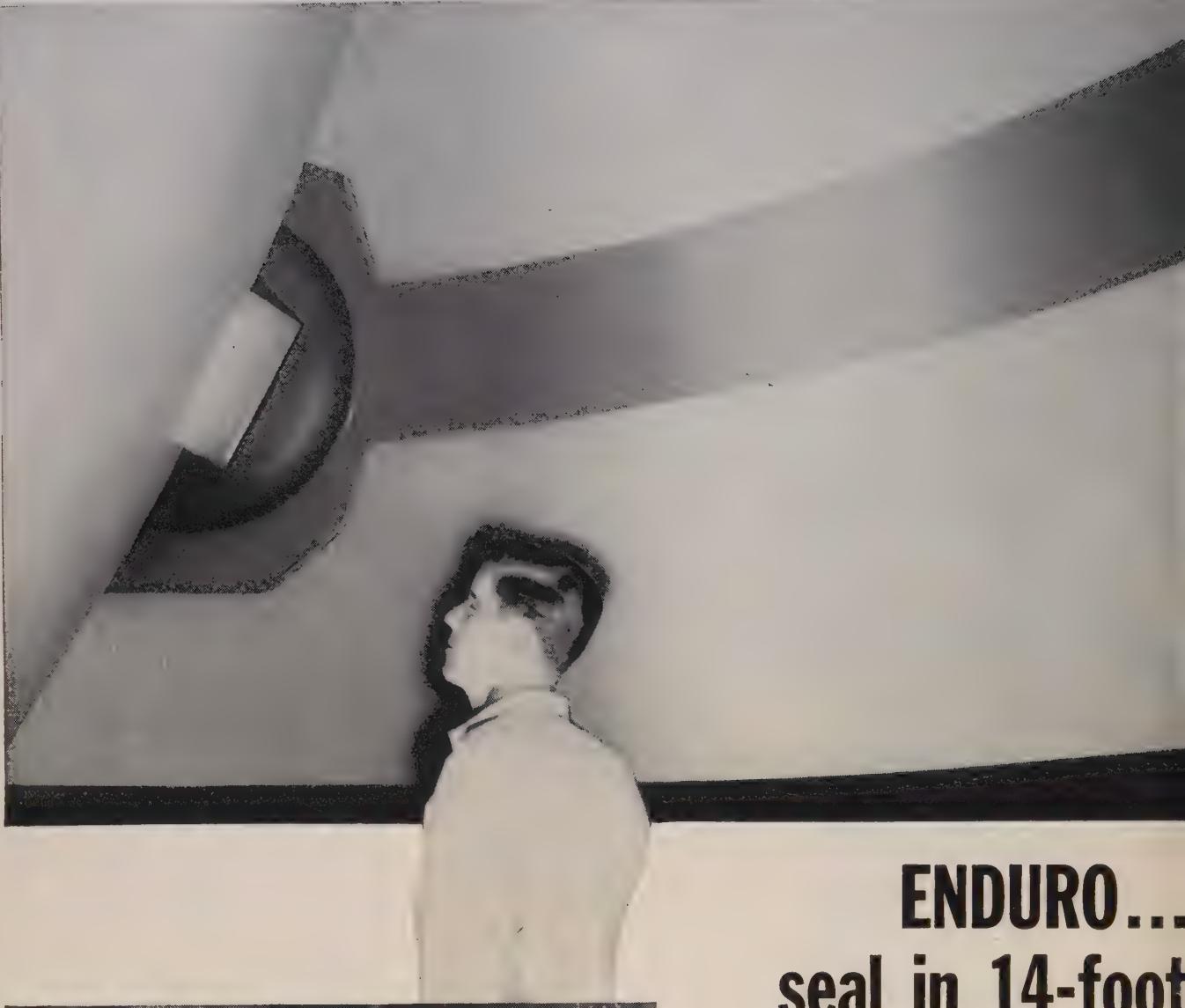
★ As the first step toward completely new service economy, write us for the whole story on **ROYAL BLUE** Wire Rope, or contact your distributor or nearest Roebling branch office.

ROEBLING

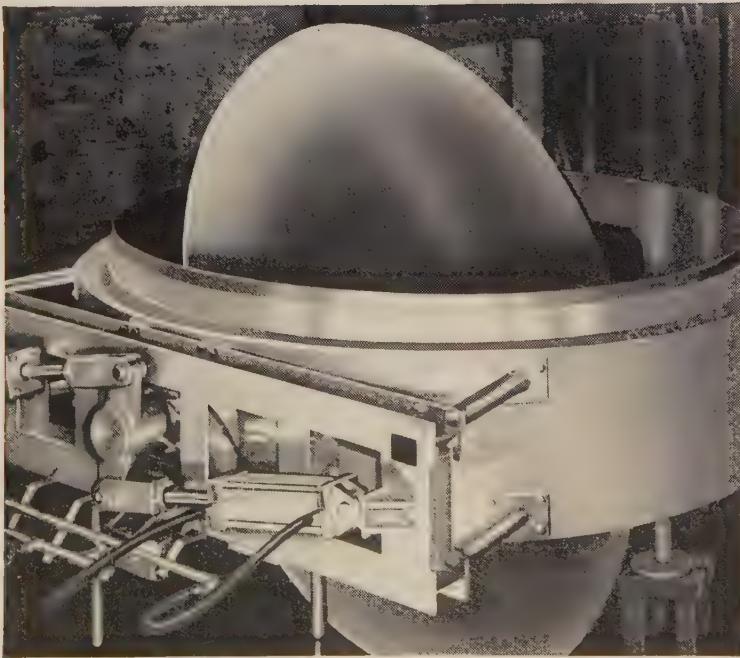
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EXPORT SALES OFFICE, TRENTON 2, N. J.





ENDURO... seal in 14-foot



Completed valve is ready for shipment to an Air Force wind tunnel. ENDURO Stainless Steel is used for the seal band which is welded to the inside of the valve body. The manufacturer, Henry Pratt Company, Chicago, also makes a chemical valve fabricated entirely from ENDURO to resist corrosion.

This stressed-seal butterfly valve was made by the Henry Pratt Company, Chicago, for an Air Force wind tunnel. The valve employs an inflatable metal seal band which "inflates" against the disc edge and provides a tight shutoff when pressure is applied. It was designed for operation under static pressure conditions ranging from 0.5 to 50 psia and a temperature range from -10°F . to $+250^{\circ}\text{F}$.

To meet these operating conditions and to combat corrosion, ENDURO Stainless Steel, Type 301, is used for the seal band. The company prefers ENDURO because of its workability and machinability. Compared to other materials previously used, machining and welding time were cut to

REPUBLIC

World's Widest Range of Standard



provides positive butterfly valve

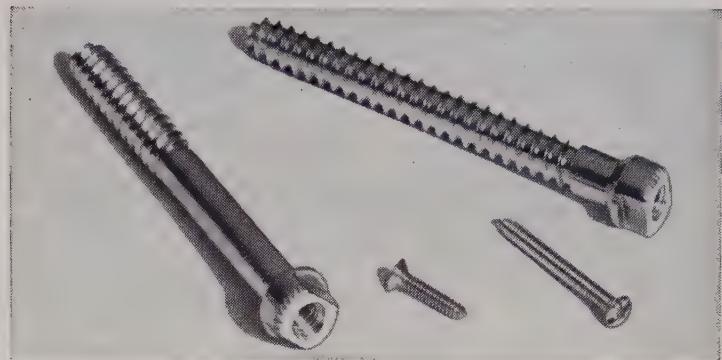
less than half.

Ease of fabrication and stubborn resistance to heat, pressure, corrosion and rust are only some of the features of ENDURO. It provides strength without prohibitive weight and bulk. It's easy to clean. ENDURO is solid stainless steel with no applied surface to chip, crack or peel. It is tough, strong and durable—resists denting and abrasion.

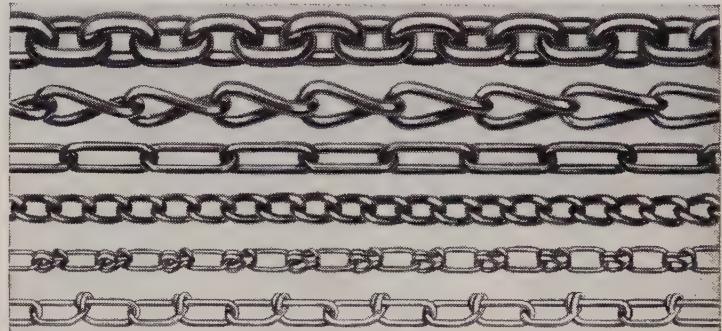
Republic's exclusive "Three-Dimensional Metallurgical Service" is ready to help you apply ENDURO's bonus benefits to your product or process. ENDURO is available through your Republic distributor in many forms—sheets, strip, hot rolled and cold finished bars, wire and tubing.

STEEL

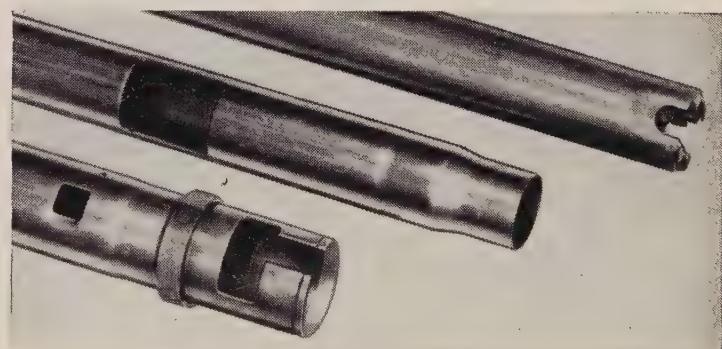
Steels and Steel Products



HERE'S MORE PROOF OF THE MACHINABILITY OF REPUBLIC TITANIUM. These bone screws were made from Republic Titanium Alloy by The Collision Surgical Engineering Co., Baltimore, Md. Machining operations included cutting off, milling, drilling, tapping, threading and buffing. Titanium is used for surgical parts and instruments because it is strong, lightweight and absolutely inert. Republic will help you use all its advantages profitably.



FOR HOISTING, HOLDING, HAULING, TOWING, BUNDLING, you can count on Republic Chain for greatest safety and dependability. Republic's Round Chain Division makes a complete line of welded and weldless chain for every industrial requirement—every type of fitting, attachment and accessory. Strategic location of Republic Chain plants and warehouses assures you of prompt delivery.



YOU CAN SAVE ON TUBULAR PARTS LIKE THESE when Republic does the tube fabricating. Republic's Steel and Tubes Division is equipped to handle all kinds of tough fabricating jobs—has the machinery, the experience and the ability to work out the most economical method of making quality tubular parts. And that includes complete assemblies. Call in Republic to quote when you want to keep fabricating costs down.

REPUBLIC STEEL CORPORATION
3120 East 45th Street
Cleveland 27, Ohio

Please send more information on:
 ENDURO® Stainless Steel
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360° hoist hook service . . .



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PEDESTAL JIB

Here's the answer to economical local handling service to process machines, particularly beneath heavy mill type cranes . . . it's the American MonoRail Pedestal Jib. These jibs are recommended for capacities between 500 to 4,000 pounds, headroom 9 and 12 feet, and boom length 8 and 12 feet . . . a truly precision built, skillfully engineered job.

Turn to American MonoRail for any overhead handling requirements. Your American MonoRail engineers will be glad to consult with you.



For any MonoRail application
write for Bulletin C-1

AMERICAN

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HANDLING
EQUIPMENT

MonoRAIL COMPANY

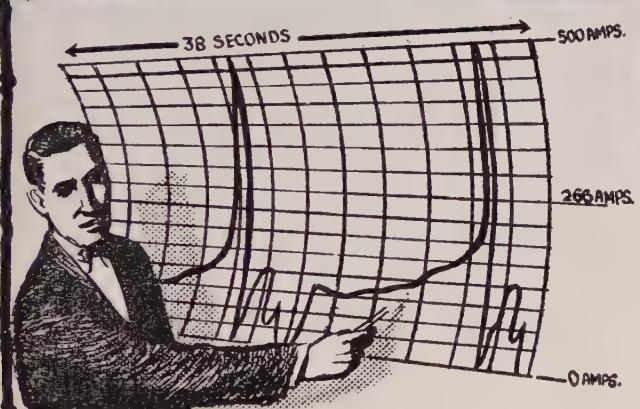
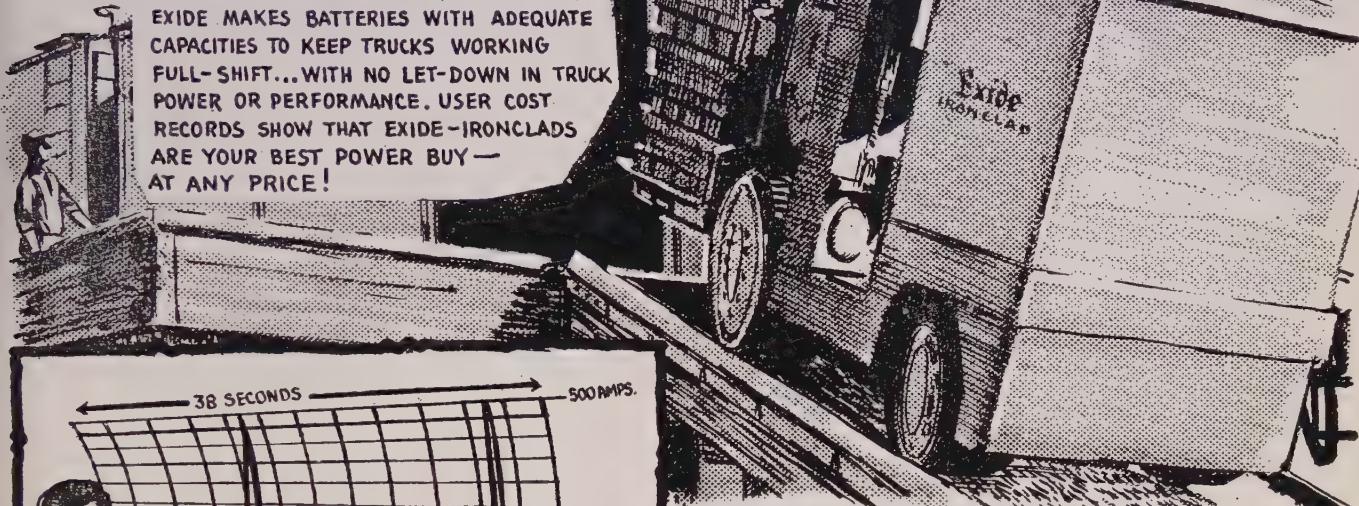
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[IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.]

FACTS ABOUT **Exide**[®]

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NO MOVING JOB IMPOSSIBLE!

STEEP RAMPS, LONG HAULS, HEAVY LOADS... NO JOB IS IMPOSSIBLE WHEN ELECTRIC TRUCKS ARE POWERED WITH IRONCLADS. EXIDE MAKES BATTERIES WITH ADEQUATE CAPACITIES TO KEEP TRUCKS WORKING FULL-SHIFT...WITH NO LET-DOWN IN TRUCK POWER OR PERFORMANCE. USER COST RECORDS SHOW THAT EXIDE-IRONCLADS ARE YOUR BEST POWER BUY—AT ANY PRICE!



PORTRAIT OF AN **EXIDE WORKING**

IN JUST TWO MOVES AND 38 SECONDS A FORK TRUCK MAY DRAW ENERGY FROM ITS BATTERY IN THIS PATTERN, IN RESPONSE TO 44 SEPARATE CONTROLLER OPERATIONS. IN AN 8-HOUR SHIFT, 3000 SUCH DEMANDS MAY BE MADE. EXIDE-IRONCLADS ASSURE RAPID, ACCURATE HANDLING OF MATERIAL... THEY RESPOND INSTANTLY TO THESE RAPIDLY RECURRING DEMANDS FOR HIGH POWER FOR SHORT DURATIONS.

TUBES OF POWER WORK FOR YOU INSIDE AN IRONCLAD

SLOTTED TUBES INSIDE AN IRONCLAD KEEP ACTIVE MATERIAL IN FIRM CONTACT WITH CONDUCTING GRIDS OF THE POSITIVE PLATE... THIS GRID PROTECTION LENGTHENS THE LIFE OF THE BATTERY. SLOTTED TUBES EXPOSE MORE ACTIVE MATERIAL TO THE ELECTROLYTE... FOR GREATER POWER, FINE TUBE SLOTS HOLD MATERIAL IN CONTACT WITH GRID LONGER... RESULT, THE IRONCLAD'S ABILITY TO DO YOUR MATERIALS MOVING JOB FOR A LONGER PERIOD OF TIME. THAT IS WHY EXIDE-IRONCLADS ARE YOUR BEST INDUSTRIAL TRUCK BATTERY BUY—AT ANY PRICE!

LET EXIDE HELP SOLVE YOUR INDUSTRIAL TRUCK BATTERY PROBLEMS. ① CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS. ② WRITE FOR FORM 1982, A MANUAL ON INSTALLING AND MAINTAINING MOTIVE POWER BATTERIES.

PROTECTED CONDUCTING GRID
COMPRESSED ACTIVE MATERIAL
SLOTTED RETAINER TUBE



Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

Koppers rebuilds coke ovens from the ground up!

BESIDES BUILDING NEW COKE OVENS, Koppers specializes in prolonging the life of old ovens. Koppers does this by repairing them, or when necessary, by rebuilding them from the ground up.

In many cases, preventive maintenance by Koppers can head off major repairs. For example, it pays to straighten buckstays and renew jamb castings *before* the heating-wall brickwork has been seriously damaged.

However, even if a battery of coke ovens has reached the advanced stages of deterioration, it can be rehabilitated by Koppers so that it will enjoy many *extra* years of productive life. When Koppers repairs coke ovens, part of the battery can be kept in operation.

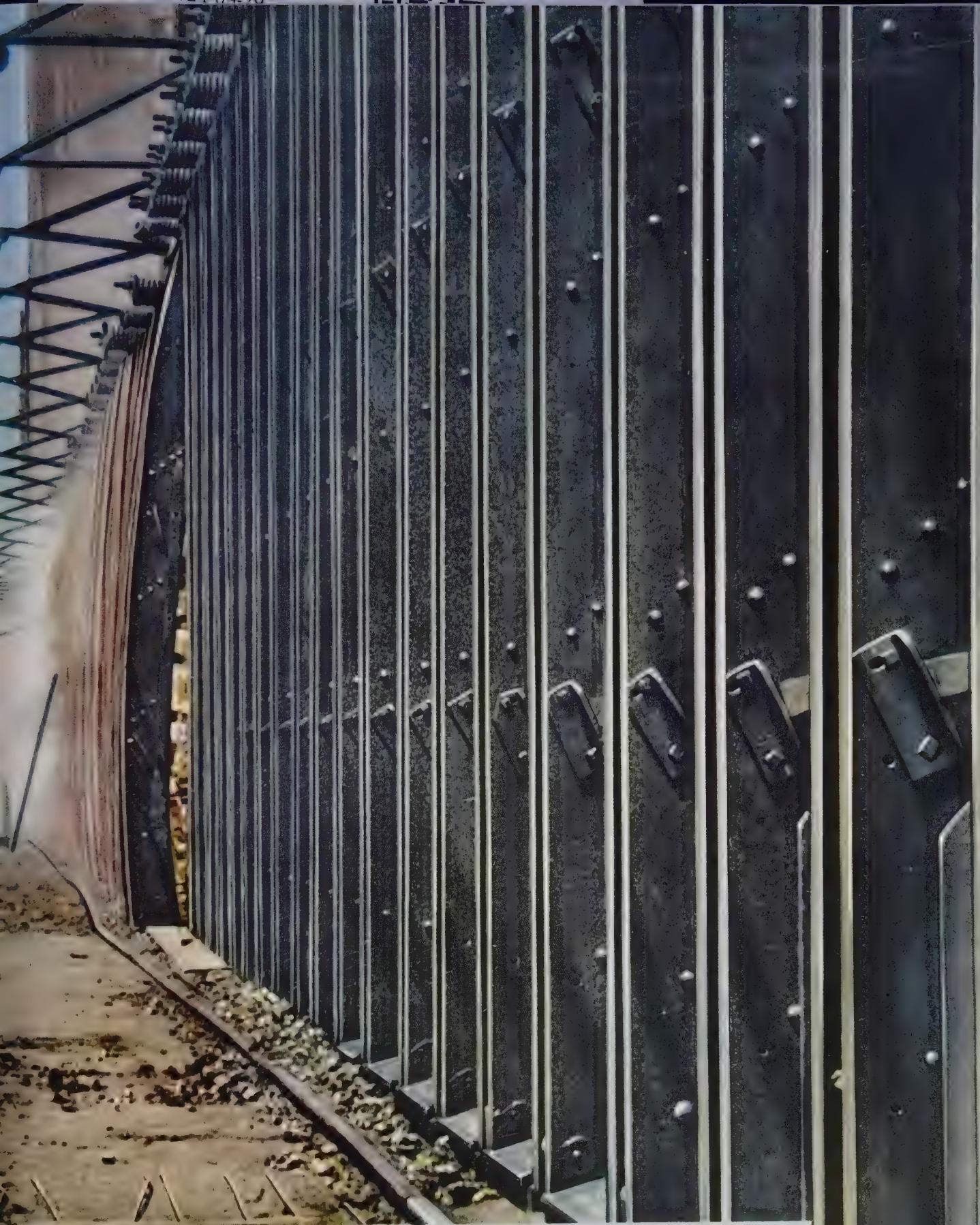
Our inspectors will be glad to examine your coke plant. Their report will be reviewed and evaluated by men who have been designing, building and repairing coke ovens for many years. Then, where necessary, recommendations for repair work will be made. Your inquiry is invited regarding this service.

Constructing, rebuilding or repairing coke ovens is just one way in which Koppers serves the steel industry. For any kind of metallurgical construction, you can count on Koppers.



*Engineering and
Construction Division*

KOPPERS COMPANY, INC., PITTSBURGH 19, PENNSYLVANIA

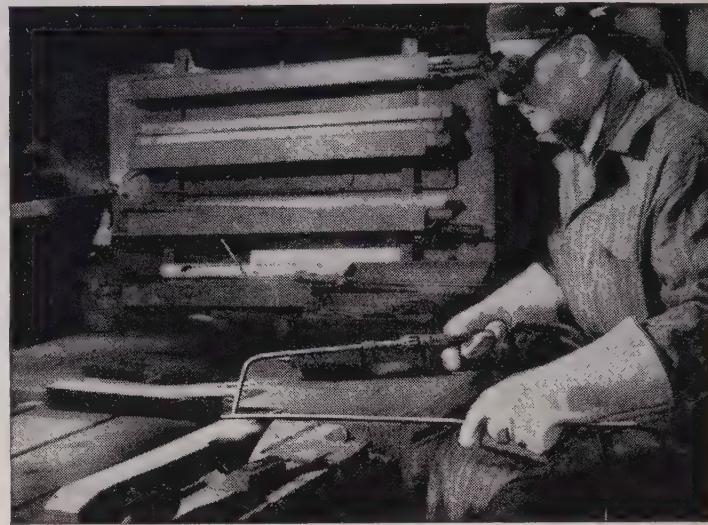


Battery of coke ovens being repaired by Koppers. Note bowed and distorted buckstays in background. Compare with new buckstays in foreground. Bench is also in the process of being repaired and straightened.

Hard-Facing Helped Here...it Can Help You Too!

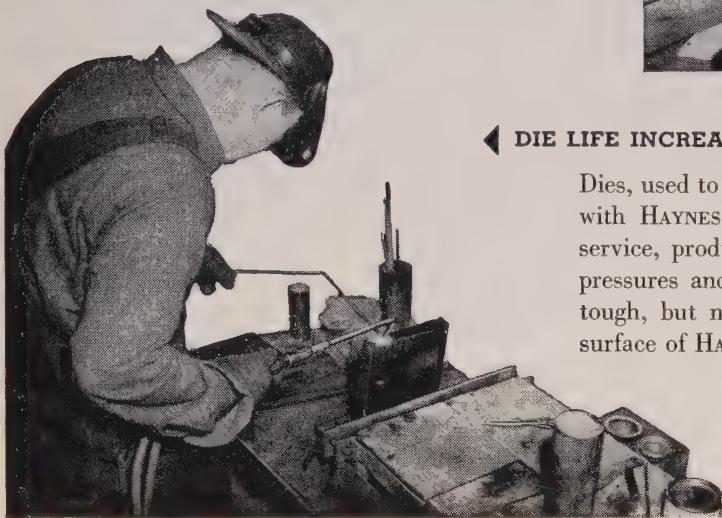
LIFE INCREASED 400% ▶

Hard-facing these entry guides with a wear- and heat-resistant HAYNES STELLITE alloy increases their service life from 4 to 5 times. Unprotected guides failed after handling only 40 tons of hot steel bars, while the ones protected with HAYNES STELLITE alloy handled up to 200 tons. The guides are subjected to continual abrasion and heat from the hot steel passing through them.



◀ DIE LIFE INCREASED 500%

Dies, used to shape refractory tile, last 5 times longer when hard-faced with HAYNES STELLITE alloys. Hard-faced dies have given 10 years' service, producing up to 500,000 tiles. The dies have to resist high pressures and abrasion from dry press operations. Unfaced dies are tough, but need the wear-resistance gained from a hard, protective surface of HAYNES STELLITE alloys.



AN ALLOY FOR EVERY JOB ▶

There are 14 different HAYNES hard-facing alloys. Some are hard and abrasion-resistant, some are tough and ductile, capable of withstanding the shock of severe impact; others give extraordinary service under conditions of corrosion, erosion, and heat. Descriptions of each alloy and procedures for applying it are included in the booklet, "HAYNES Alloys Hard-Facing Manual." Write today for your free copy.

HARD-FACE AND SAVE WITH

HAYNES *alloys*
Trade-Mark

Hard-facing products made from cobalt-base alloys, nickel-base alloys, iron-base alloys, and cast tungsten carbide in the form of tube rods and coils.

"Haynes" and "Haynes Stellite" are registered trade-marks of Union Carbide and Carbon Corporation.



Haynes Stellite Company

A Division of
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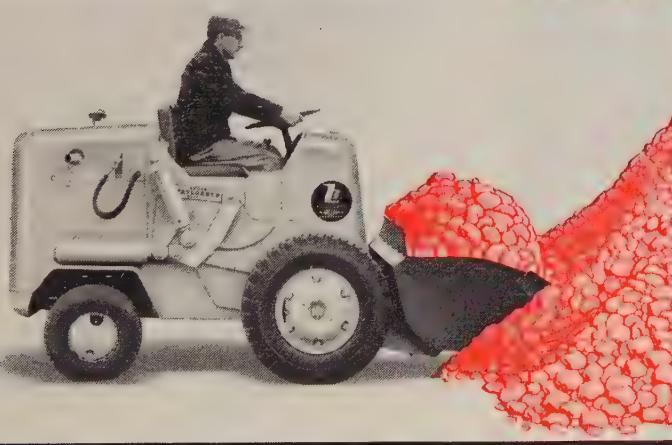
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A completely new and different

PAYLOADER®

TRACTOR SHOVEL



Powerful
break-out
digging action

Fast, efficient bucket-loading action of the new Model HA "PAYLOADER" begins when the machine moves forward and forces the 18 cu. ft. bucket into the pile with up to 3,100 pounds of push.

Twin, double-acting hydraulic rams, independent of the boom elevators, next rotate the bucket on its hinges . . . the cutting edge slices up through the pile in a powerful "break-out" digging action.

Bucket roll-back of 40° is now completed. The loaded bucket is close to the machine and low — only six inches off the ground—in a stable, sure position for safe, rapid transport at speeds up to 10 mph.

Your Hough Distributor is ready to demonstrate this completely new and different Model HA and what it can do.

THE FRANK G. HOUGH CO.

876 Sunnyside Ave., Libertyville, Ill.

Send complete information on the 1955 Model HA "PAYLOADER".

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TITLE _____

COMPANY _____

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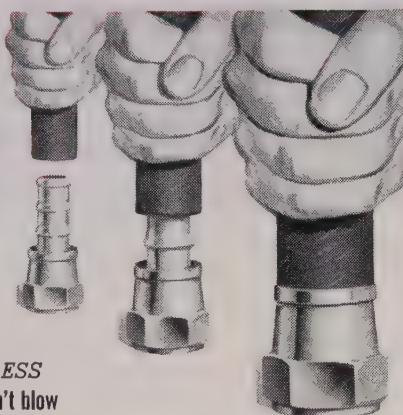
PAYLOADER®

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THE FRANK G. HOUGH CO. • LIBERTYVILLE, ILL.
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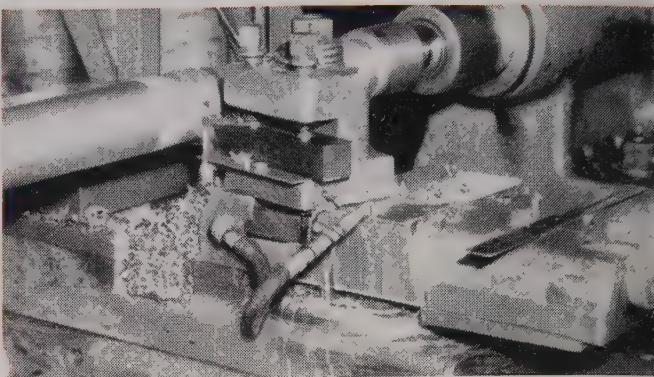


Revolutionary New Hose Line Speeds Maintenance!

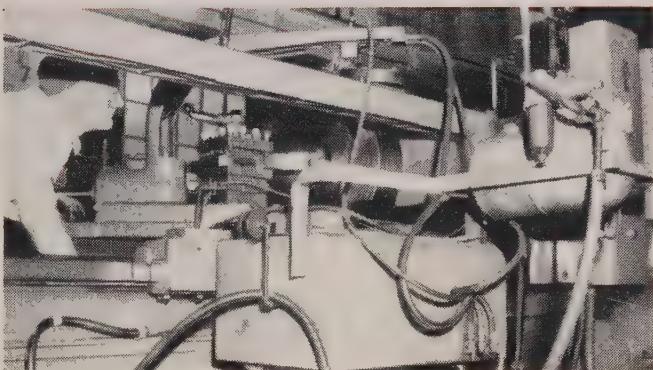


Hose line assembly couldn't be quicker or easier! For quick replacements, just cut Aeroquip 1525 hose to required length and PUSH it on the **SOCKETLESS** fittings . . . they won't blow off, even at 250 p.s.i.

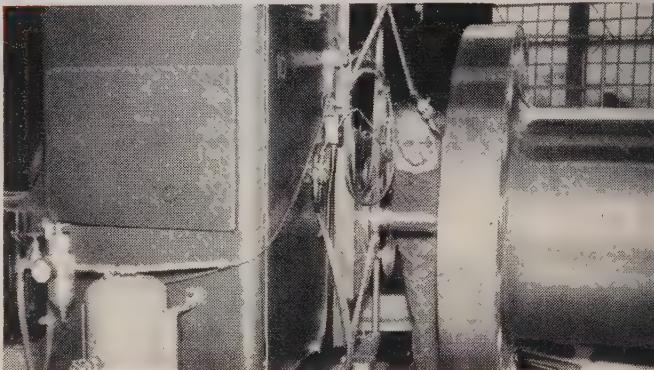
Patent Applied For



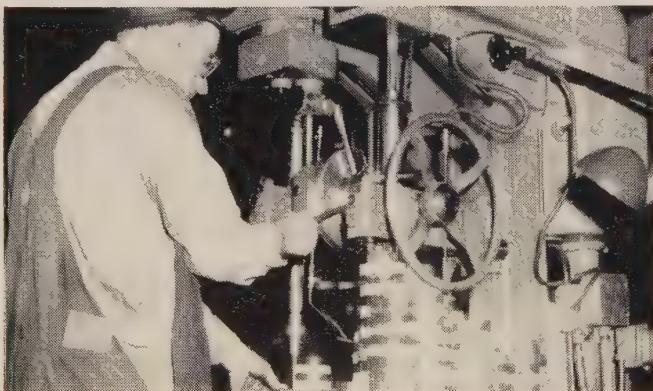
Aeroquip **SOCKETLESS** fittings and hose were used to make the coolant line on this engine lathe. This hose line can withstand vibration and constant flexing.



Two of the original three hose lines on this tracer lathe failed and were replaced with Aeroquip hose lines made right on the spot.



Lube lines, like those used on this boring machine, are easy to make when you have Aeroquip 1525 hose and **SOCKETLESS** fittings on hand.



Here Aeroquip 1525 hose and **SOCKETLESS** fittings carry the pressure coolant that lubricates this double drill press.

AEROQUIP **SOCKETLESS** FITTINGS AND HOSE

are available in $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{5}{8}$ " sizes. A small supply assures quick replacements for fuel, oil, water, air and coolant lines on all industrial equipment. See your Aeroquip distributor, or write us for complete information.

These are a few of the Aeroquip **SOCKETLESS** applications in a single plant (name on request).

 **Aeroquip**
REG. TRADEMARK

AEROQUIP CORPORATION, JACKSON, MICHIGAN

LOCAL REPRESENTATIVES IN PRINCIPAL CITIES IN U.S.A. AND ABROAD • AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

*Not a "hospital case" in a
trainload of AMERICAN
PHILLIPS SCREWS*

Neither workers nor their work suffer injuries where assembly departments are standardized on American Phillips Screws. For the cross-recessed screwheads don't split or burr . . . the 4-winged drivers don't slip and slash . . . so your skilled workers and costly work-in-process are *safe*. No lost time accidents . . . no rejected products, spoiled materials.

Safety is just one of the reasons why American Phillips Screws *cost less to use*. Easier handling, faster driving, and tighter assemblies with fewer screws . . . these are other American Phillips factors that save 50% over old-fashioned fastening methods. So make it faster and make it safer with American.

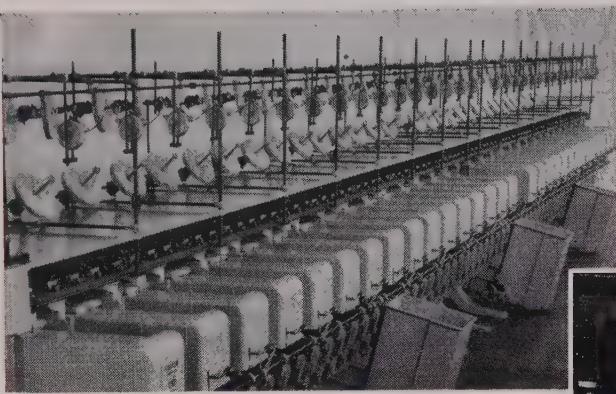
X marks the spot
... the mark of extra quality

AMERICAN SCREW CO.

PHILLIPS HEADquarters
WILLIMANTIC, CONNECTICUT

Plants at Willimantic, Conn., and at Norristown, Pa.
Warehouse and office at Chicago
Office, Detroit, Michigan

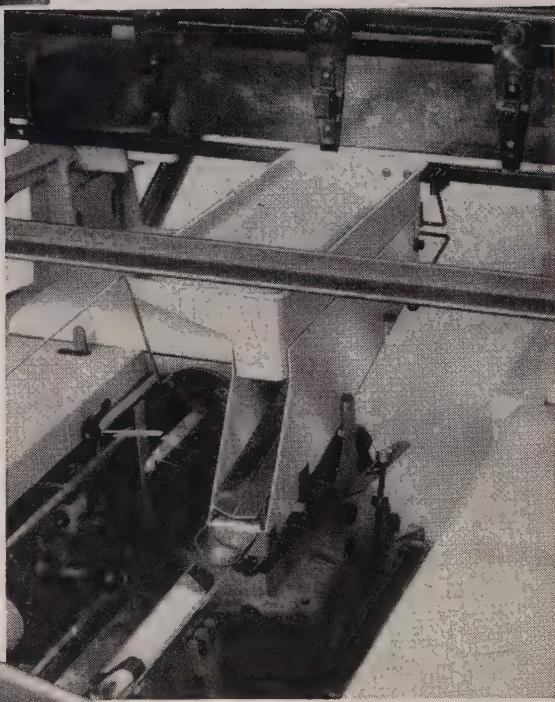




Perfect Partner for Metal

**"U. S. Royalite saved us 66%
in costs and gave us 7
outstanding advantages."**

L. M. Sawtell
Foster Machine Co.
Westfield, Mass.



U.S. ROYALITE
TOUGH, VERSATILE FABRICATING MATERIAL



UNITED STATES RUBBER COMPANY
2638 NORTH PULASKI ROAD, CHICAGO 39, ILLINOIS

The giant machine shown above is a Foster Muschamp Model 66 bobbin winder. The empty bobbins (or pirls) which are fed along the top of the machine, drop off a belt into receivers known as pirl magazines. All day long these pirl magazines take a series of impacts at the maximum rate of one a minute. They must be **TOUGH** and **DURABLE**!

Duplicon, Inc., Westboro, Mass., specialists in combining plastics with metal, engineered, designed and produced this pirl magazine for Foster Machine Company by riveting easily formed, tough, versatile Royalite "2,000" to steel. In addition to the substantial material savings over all-steel construction, seven other advantages were quickly apparent:

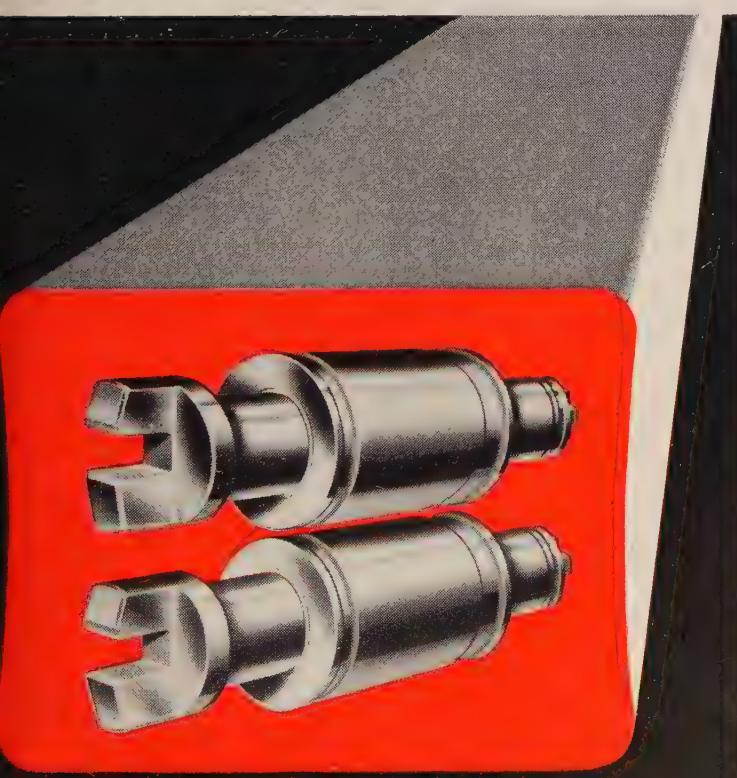
- Lighter in weight.
- Noiseless during operation.
- Will not rust, even under high humidity.
- No painting necessary.
- Neater in appearance.
- Less expensive tooling.
- Greater flexibility.

U. S. Royalite "2,000" is the perfect running mate for all metals. It can be formed on low-cost tools, sawed, bent, punched or drilled, then bolted or riveted to metal. Learn all about this fabulous fabricating material by writing to:



IN SLABBING MILLS AND BLOOMING MILLS

Productioneering begins with Mack-Hemp Rolls



If you've been keeping your eye on what's new at Mack-Hemp, you already know about the improvements in Striped Red Wabbler blooming and slabbing mill rolls.

But, just in case you missed hearing users talk about these *production tools*, you'll be interested in their capabilities.

Actually, Mack-Hemp has applied some new heat-treating techniques to reduce susceptibility to fire-cracking. These metallurgical improvements are important because they help increase blooming and slabbing mill production.

There's no time like the present to discuss these efficient Striped Red Wabbler Rolls, and you'll certainly want to know something about their service records. Meanwhile, though, you'll find it's worthwhile to keep an eye on *everything that's new at Mack-Hemp*.



MACKINTOSH-HEMPHILL CO.

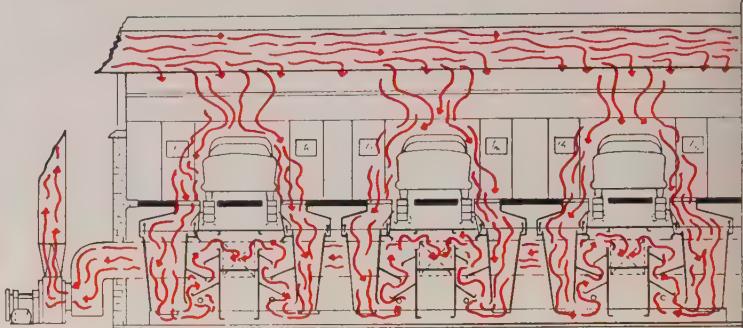
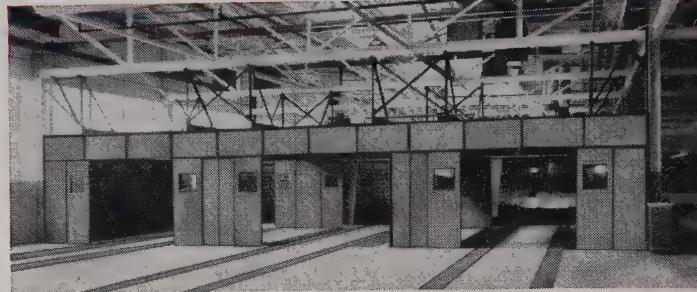
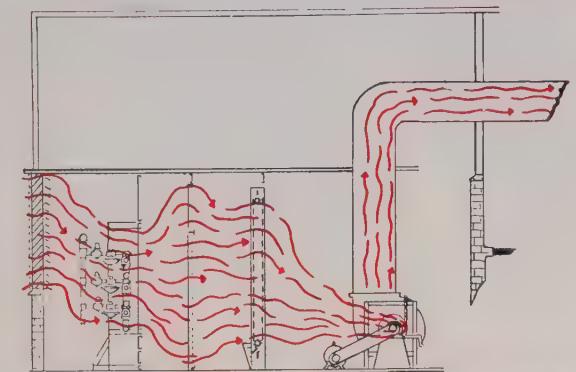
Makers of the Rolls with the Striped Red Wabblers

PITTSBURGH AND MIDLAND, PA.

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: all types of cast mill rolls . . . improved Johnston patented corrugated cinder pots and slag handling equipment . . . Mackintosh-Hemphill rotary straighteners—electronically controlled contouring lathes—screw feed roll turning lathes—heavy duty engine lathes . . . shears . . . end-thrust bearings . . . steel and special alloy castings . . . reversing hot strip mills . . . Y-type cold strip mills



Another Problem... **FINISHED**



Here's an Unusual Finishing System by Peters-Dalton. It Requires an Unusual Disposition and Use of Spraying and Drying Equipment in a Major Automobile Plant

PETERS-DALTON are exclusively contract manufacturers. Knowing this, a major automobile company called upon us to meet its special requirements. This manufacturer wanted a Finishing System installed, of a type comparatively unknown to industry. It requires this system for maintenance of its own high standards of product finish. The installation by PETERS-DALTON now assures this company of delivery of its automobiles with 100 per cent perfect finishes. The Finishing System receives automobiles after leaving final assembly. The cars move through the upper level of the system on conveyors where any necessary repainting or touchup is made. Cleaning of paint-laden exhaust air is done by equipment in the basement level . . . heating and cleaning of supply air is completed outside the building.

Whether you require such a complicated system or one of a basically simple nature, depend on the more than quarter century of PETERS-DALTON engineering experience. We are ready and able to meet your needs — meet them with economy to you of time and costs — and on an individual basis. Find out for yourself — just write, wire or phone.

Representatives in Principal Cities

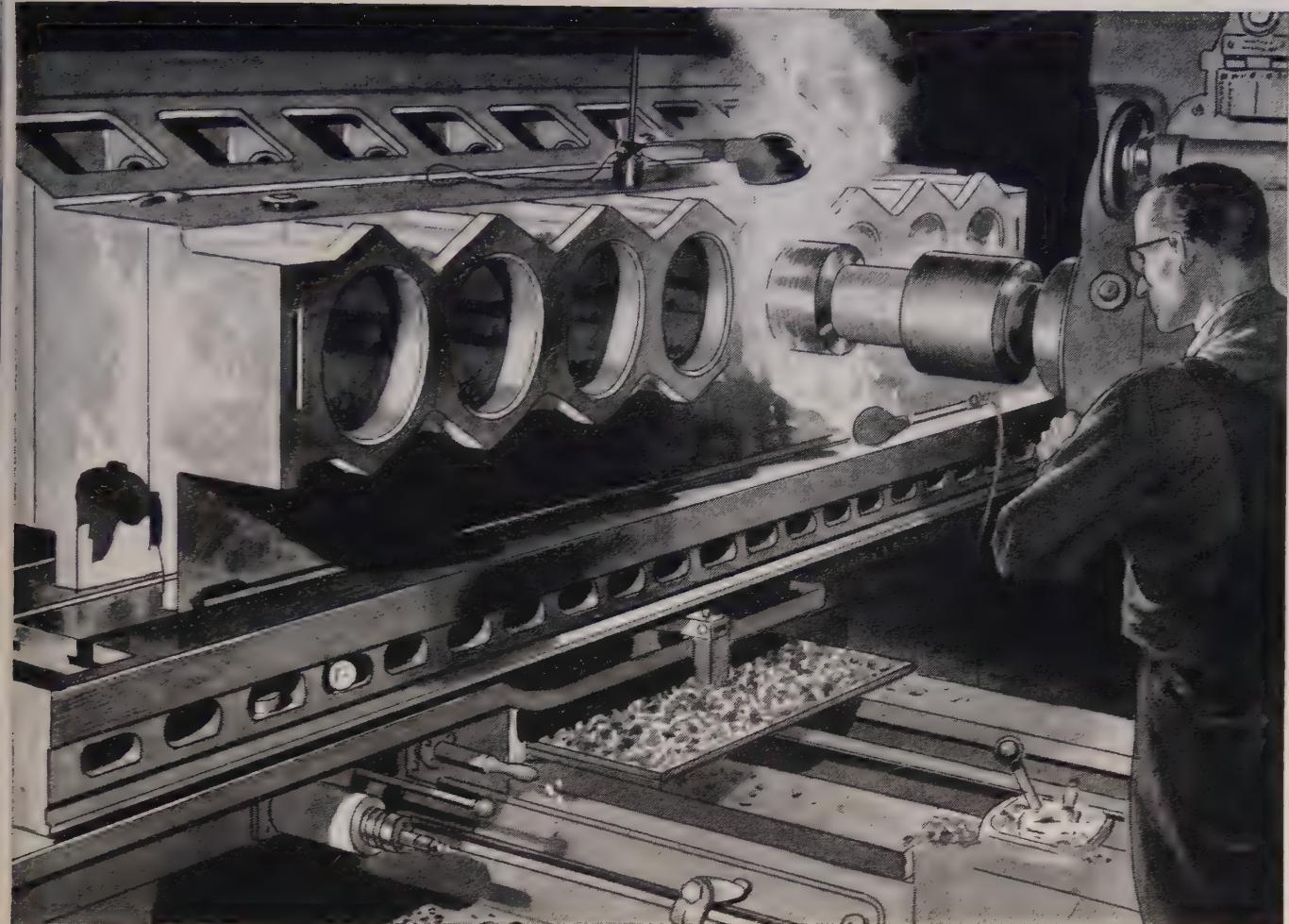


Peters-Dalton INC.

17892 Ryan Road

Detroit 12, Michigan

- PD Hydro-Whirl Paint Spray Booths
- PD Industrial Washing Equipment
- PD Drying and Baking Ovens
- PD Hydro-Whirl Dust Collecting Systems



Insure good machinability with as little as 2 to 4 lb. of SMZ alloy per ton of Iron

Today's high-speed machining operations make it more important than ever to control the structure of iron castings. Castings with chilled corners and edges or hard spots may cause costly tool breakage and interrupted production.

An effective, low-cost method of insuring satisfactory machinability is the addition of SMZ alloy to the iron in the ladle. An addition of only 2 to 4 lb. per ton of iron is sufficient to reduce chill,

control the uniformity of structure, and produce castings with excellent machinability.

SMZ alloy is a balanced inoculant containing 60 to 65 per cent silicon, 5 to 7 per cent manganese, and 5 to 7 per cent zirconium. Further information about the advantages of using SMZ alloy will be gladly furnished on request. The ELECTROMET office nearest you will be pleased to answer your inquiry.

The terms "Electromet" and "SMZ" are registered trade-marks of Union Carbide and Carbon Corporation.

ELECTRO METALLURGICAL COMPANY

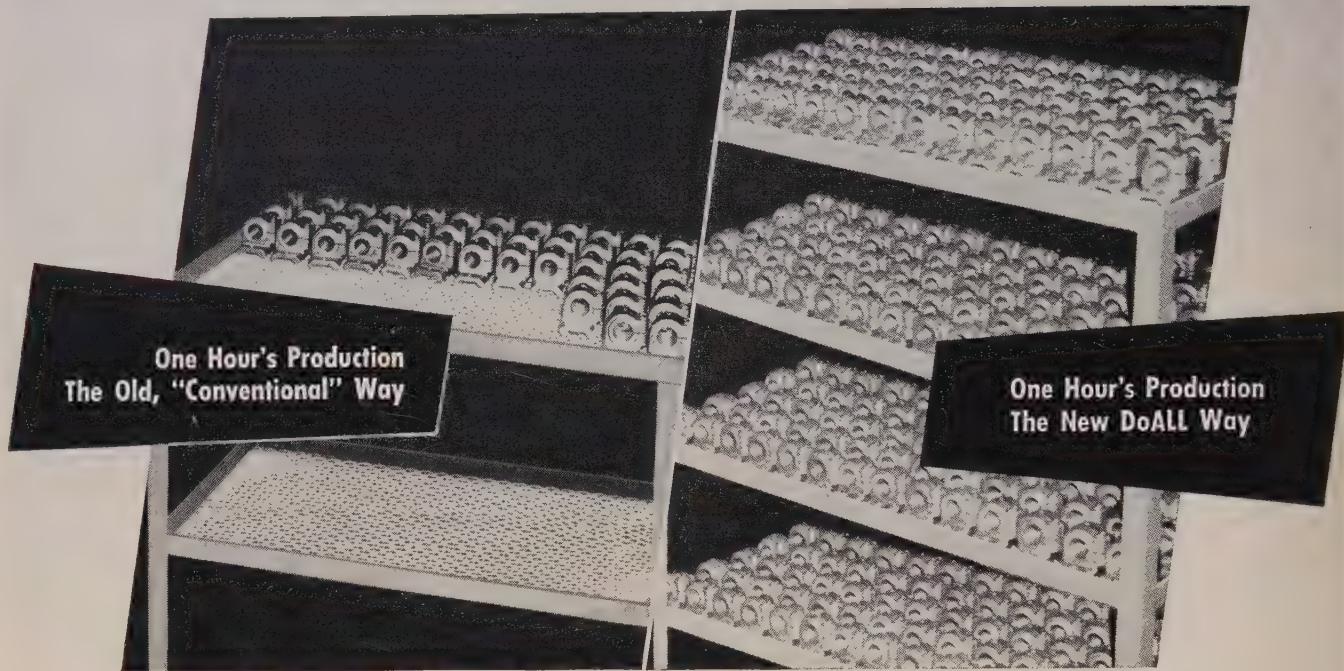
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street  New York 17, N. Y.

OFFICES Birmingham • Chicago • Cleveland • Denver
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In Canada Electro Metallurgical Company Division
of Union Carbide Canada Limited, Welland, Ontario

Electromet
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Ferro-Alloys and Metals

There is a New Machining Concept to Cut Your Production Costs



THE pictures above show the cost-reduction opportunities of modern production band machining! The job is that of cutting slots in cast bronze clamps. Formerly done with a slitting saw on a milling machine, production was about 38 pieces per hour. Now done with a DoALL production band machine, production is nearly 250 pieces per hour.

Look at the simple, inexpensive fixture shown at the right. Slip the work in position, push a button and the hydraulic power feed table carries it into the continuous-cutting band tool. Upon completion of the cut the table backs out. An integral coolant system promotes high cutting rates, insures good finishes.

Great usefulness of the machine is assured by the "non-restricted geometry" of band machining—cuts in the workpiece can be made at any angle or in any direction.

Faster cutting, greater versatility, simpler fixturing, lower tool cost, lower capital investment—production band machining is the



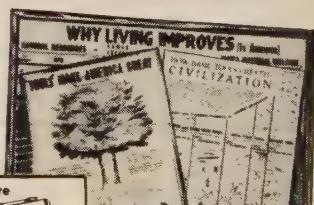
cost-reducing answer to thousands of production machining operations. Ask for a free demonstration at your plant. Call your local DoALL Store (see classified directory), or write: *The DoALL Co., Des Plaines, Ill.*



PB-11



NEW COLOR FILM—"Production Band Machining" now available showing operation of this new machining concept.



The DoALL Company, Des Plaines, Ill.

EDUCATIONAL STUDY WALL CHARTS

Economic Principles
\$1.00 each postpaid
Lower quantity prices.

Friendly DoALL Stores... (in 40 cities)

Personalized Service... Complete Stocks... Local Delivery



Now available... a complete line of **U-L APPROVED LP-Gas lift trucks**

... 2000 to 7000 lb. capacities

You get **THESE BENEFITS** with Clark LPG lift trucks:

1. Reduced engine wear, longer life: LPG burns with nearly perfect combustion, leaves no carbon or lead deposits.

2. Increased oil life, better lubrication: LPG won't dilute crankcase oil.

3. Reduced spark plug maintenance: LPG won't foul spark plugs, even with long idling time.

4. Quieter, smoother operation: no detonations with LPG.

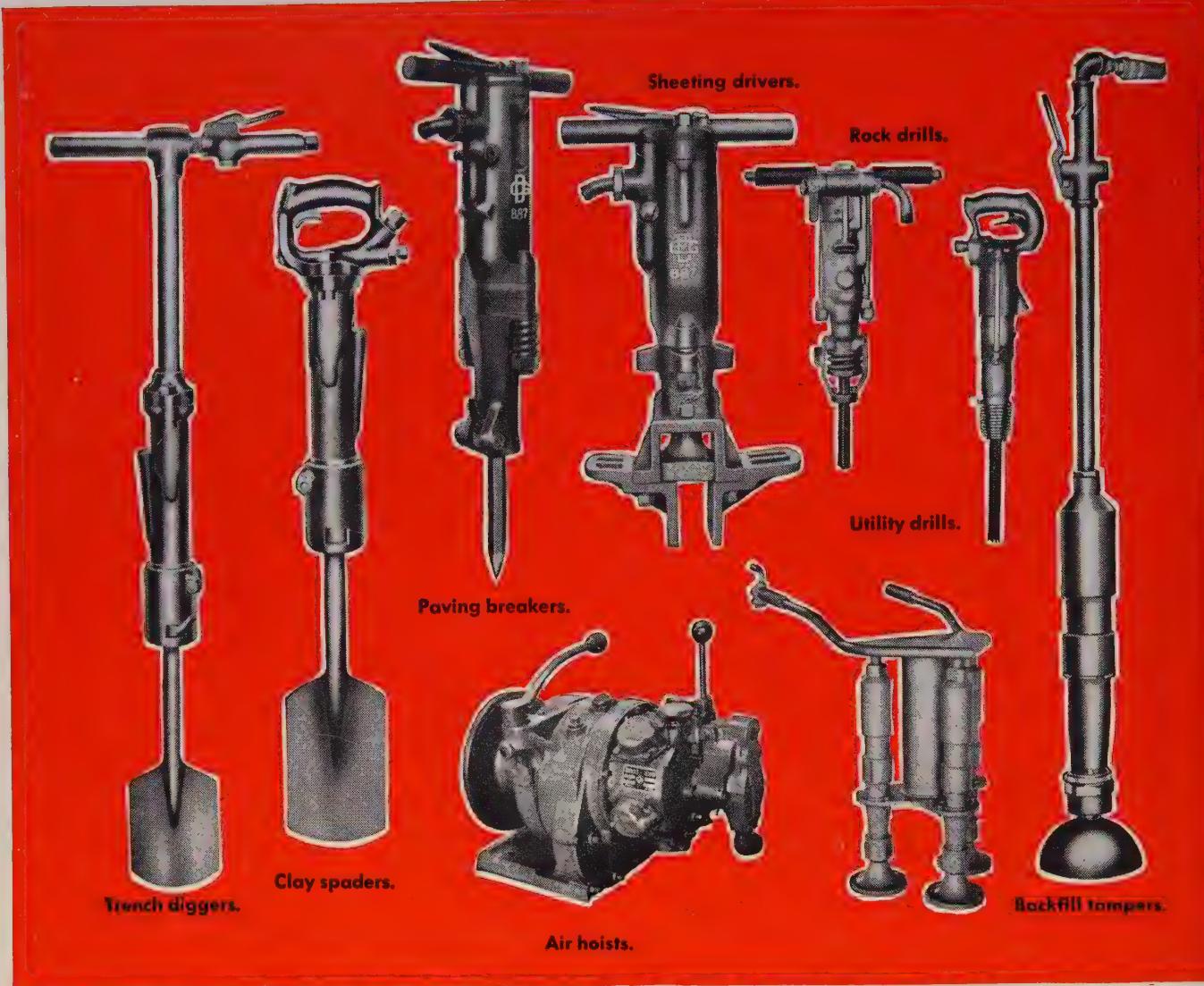
5. Cheaper fuel: especially in bulk quantities.

6. Improved indoor working conditions: LPG burns clean, reduces fumes.

Recent field reports indicate enthusiastic approval of the benefits of LPG lift truck operation. Users report substantial savings in their materials handling operations—lower fuel cost, less maintenance and down-time, improved indoor working conditions. For full details, call your local Clark dealer or write:

Industrial Truck Division
CLARK EQUIPMENT COMPANY
Battle Creek 26, Michigan

CLARK
EQUIPMENT

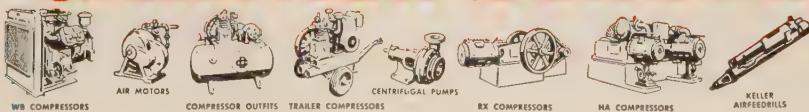


Gardner-Denver Maintenance Tools make plant housekeeping easier

Good industrial maintenance often calls for concrete demolition, masonry drilling, heavy lifting, tough digging, firm backfilling — jobs done quickly and easily by the crew that's equipped with these costsaving Gardner-Denver Air Tools —

Write for descriptive bulletin.

GARDNER-DENVER



THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS
FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY



The Gardner-Denver WH-125 — puts compressed air where you need it for operating these tools — for cleaning — for paint spraying.

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario



Design for . . . Heat and Corrosion Resistance with *Carpenter* Stainless Tubing

When hollow parts you're designing are going to wind up in hot spots—and must also resist attacks of strong corrosives—that's the time to "call for Carpenter" Stainless Tubing.

Here's a case in point. A manufacturer of gas-fired household incinerators puts long-life resistance to organic acids and scaling at temperatures of 1300-1600°F into the burner tubes by making them out of Carpenter Stainless Tubing. As a result, the part is guaranteed for many years of service life. Slotting, forming and other fabricating operations involved in making the parts are easily performed—production costs held down . . . and Carpenter quality and uniformity make the difference.

There are Carpenter analyses to combat every corrosion condition—defeat even the strongest corrosives—and remain scale-free at high temperatures. What's more, you can be sure of getting the uniform properties, tolerances, finish and quality you need for trouble-free fabrication when you specify Carpenter Stainless Tubing.

It may pay you to discuss your product designs with your nearest Carpenter Tubing Representative or Distributor. A NEW bulletin, "Fabricating and Working Data" is yours for the asking.

MEMBER

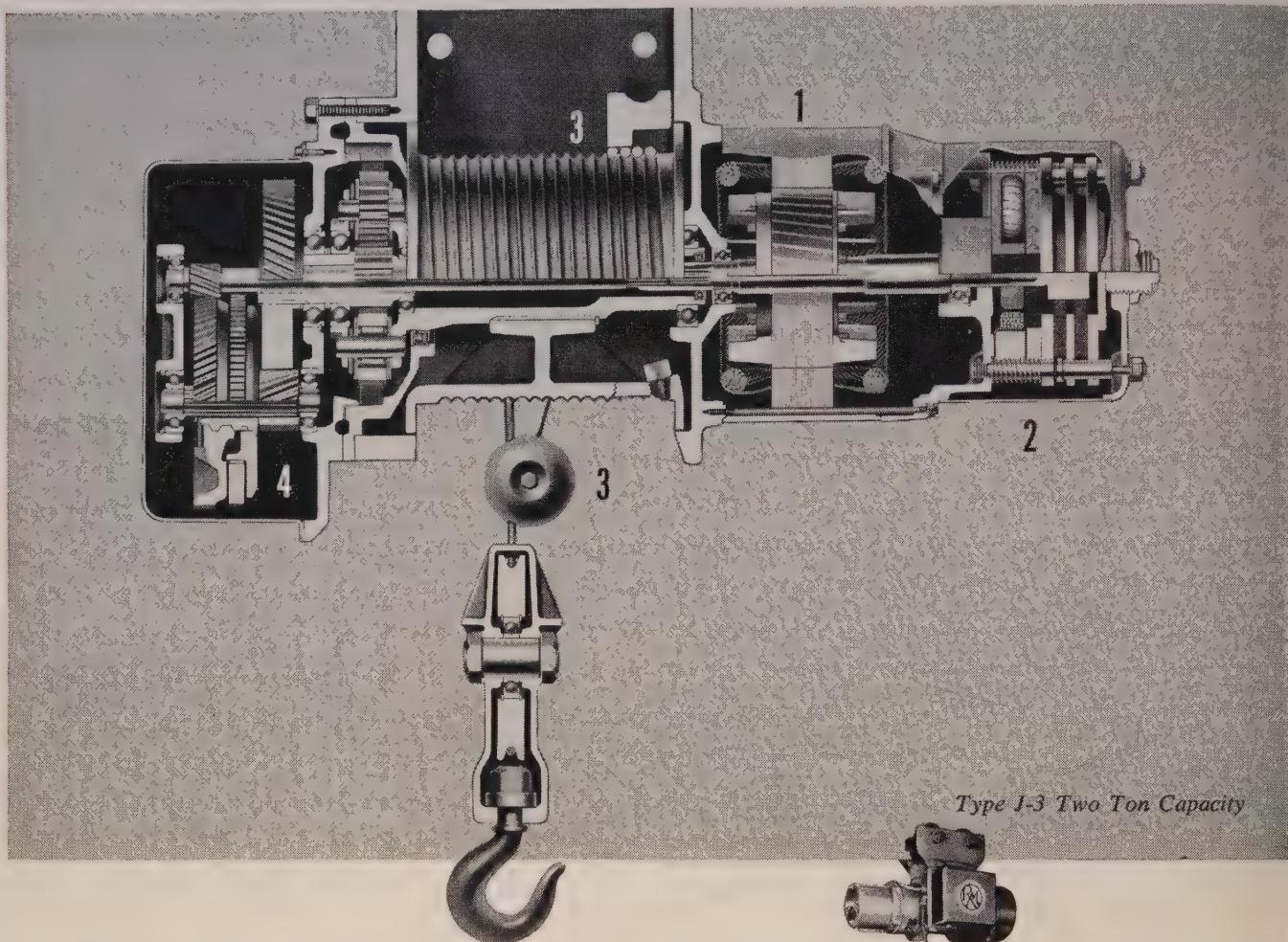


The Carpenter Steel Company
Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter

Stainless Tubing & Pipe



BIGGER LOADS: FASTER PACE

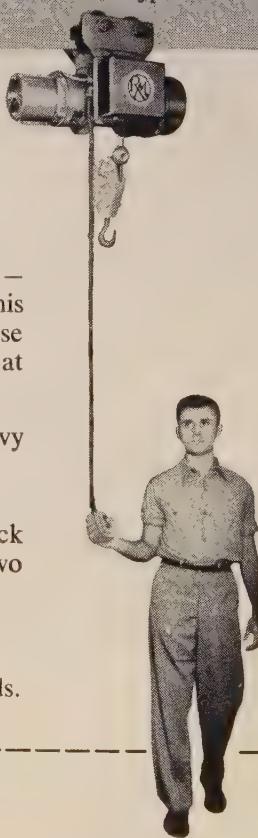
A JOB FOR THE J-3: While today's bulk loads often weigh more—by 25% to 50%—they must be lifted, moved, and spotted more quickly than yesterday's. This is a job for Robbins & Myers J-3 two-ton electric hoists, which meet these conditions, offering long life, high performance, low operating cost—and at low first cost:

- 1. **MOTOR** 2 HP Robbins & Myers, fully enclosed, 30-minute heavy duty rating—built exclusively for hoist duty.
- 2. **MOTOR BRAKE** Oversize, magnetic disc type—stops load without drift.
- 3. **LIMIT SWITCHES** Upper and lower—positively prevent over-travel of block for extra safety, lower limit switch stops hoist with two wraps of cable still snubbed on the drum.
- 4. **LOAD BRAKE** Self-adjusting, Weston type—operates in oil bath.

Other R & M Hoists and Cranes available in ratings from 500 to 20,000 pounds.

Bring your R & M hoist data files up to date. Send for free bulletin.

Send Bulletin No. 890 Have Representative call



VENTILATORS



MOYNO PUMPS



HOISTS CRANES



MOTORS



FANS

ROBBINS

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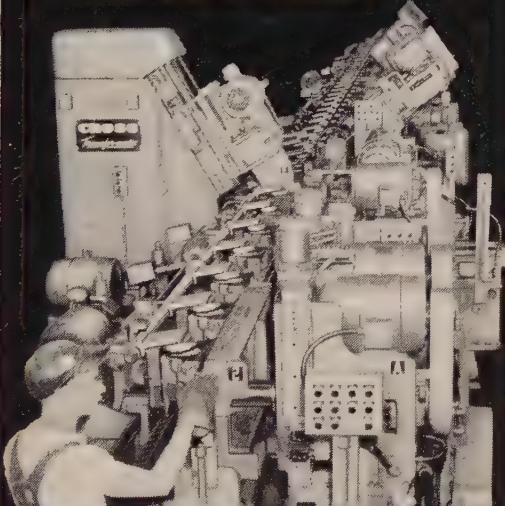
**Warner
Gear
Reduces
Downtime
with
Cross Machine
Control Unit**

A Mechanical Eye...

TO WATCH YOUR TOOLS



At right, set-up man pre-sets tools at Warner Gear Division, Borg-Warner Corp. for Transfer-matic below.



"We are well satisfied with the results we have obtained from the Cross Machine Control Unit," says Emory Watson, Master Mechanic of Warner Gear Division of Borg-Warner Corporation.

Warner Gear's experience is typical of many users. Over 500 Cross Machine Control Units are successfully reducing costs of many metal cutting operations. Here's why:

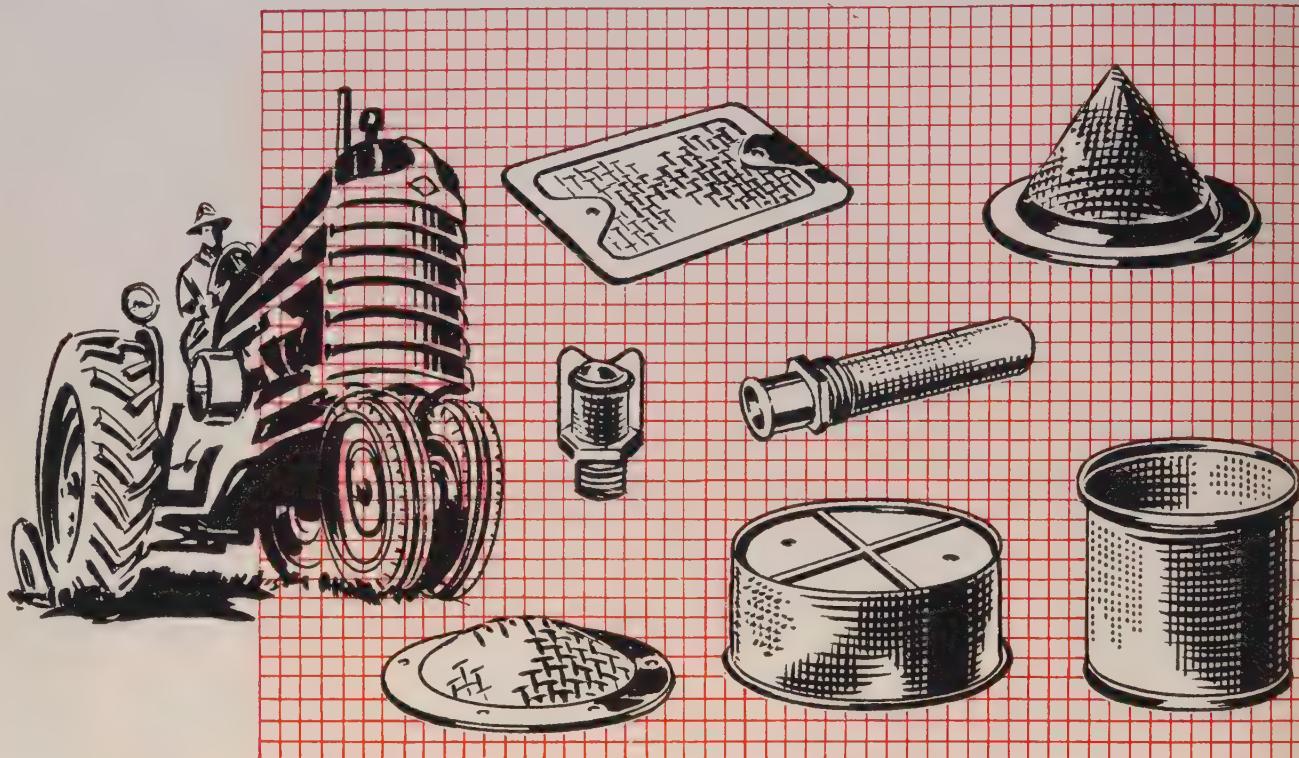
Toolometers on the Machine Control Unit assure improved tool changing programs and maximum tool efficiency. Tools—pre-set with standard fixtures and gages to eliminate machine adjustments and trial cuts—are stored in the Machine Control Unit convenient and ready when needed. Results: Reduced tool costs . . . less downtime . . . higher operating efficiency.

You can get the same cost saving benefits as Warner Gear. Write, wire or phone The Cross Company for full information, today.

Established 1898

THE **CROSS** CO.
DETROIT 7, MICHIGAN
Special MACHINE TOOLS

THIS WAY *dependability*
OF PRODUCT PERFORMANCE
IS screened in



Farm machinery must keep on keeping-on. From sewing seed to harvesting crops—everything must be done when the time is right.

That's why the wire screen cloth that does its job so unfailingly in so many small but vital farm machinery parts is important.

In the farm tractors' spark arresters, radiator grilles, brake linings, air cleaners and in all the various filters and screens using Reynolds wire cloth—failures are screened out and dependability is *screened in*.

From the fanning mills that sift and size the seed to the self-propelled harvesters—farm machinery makers know that they can rely on Reynolds to meet specifications precisely. For details see Sweet's Product Design File.

*Consult Reynolds Engineers
... no cost ... no obligation.*

Reynolds

WIRE CLOTH

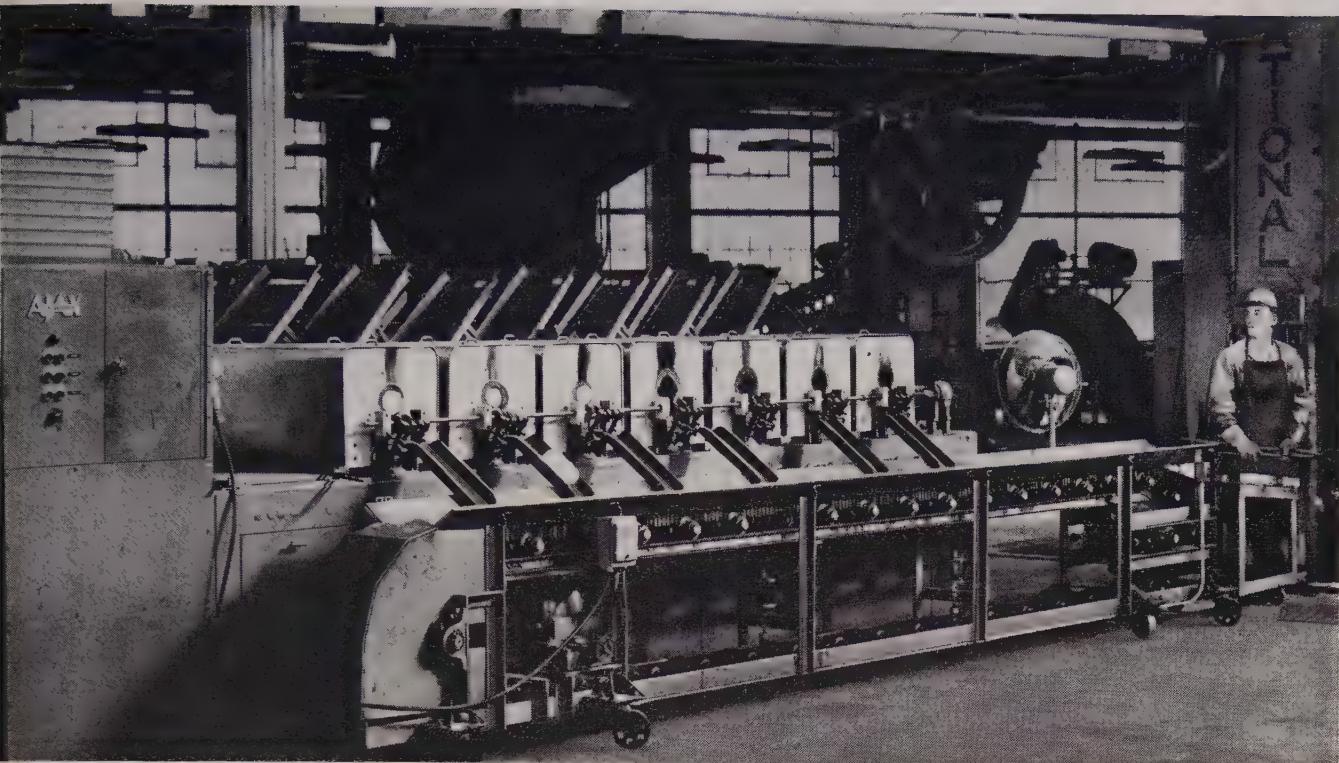
for Industry



REYNOLDS WIRE DIVISION, NATIONAL-STANDARD CO., Box 300, DIXON, ILL.

Divisions of National-Standard Co.

ATHENIA STEEL...Clifton, N. J.	Flat, High Carbon, Cold Rolled Spring Steel
NATIONAL-STANDARD...Niles, Mich.	Tire Wire, Fabricated Braids and Tape
WAGNER LITHO MACHINERY...Jersey City, N. J.	Metal Decorating Equipment
WORCESTER WIRE WORKS...Worcester, Mass.	Round and Shaped Steel Wire, Small Sizes



want to mechanize forging?

This large forge shop could show you how. Turning out auto and tractor gears along with hundreds of other parts large and small, it relies upon Ajax induction heating for faster, more efficient production . . . lower material cost . . . greatly reduced manpower . . . and an impressively low reject average.

A complete battery of over a hundred Ajax-Northrup heaters can be put into service here for heating bars of various lengths and weights and in sizes from one inch rounds to four inch squares, each scheduled for automatic or even patterned

heating at just the desired rate for the forging operation. Rapid induction heating makes scale formation almost nonexistent; forging dies last much longer.

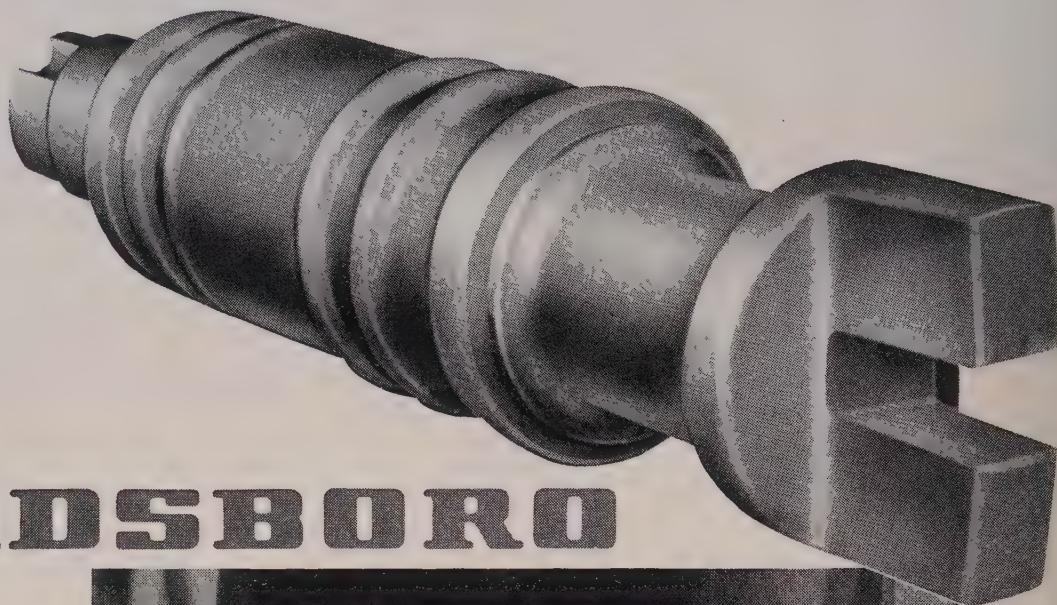
Here is mechanization brought to the difficult forging process—thanks to the speed, precision, and reproducibility of Ajax-Northrup heating. An Ajax representative will be glad to show you how it can help mechanize your production. Or, just write Ajax Electrothermic Corporation, Trenton 5, New Jersey, for Bulletin 27-B.

Associated Companies: Ajax Electric Company—Ajax Electric Furnace Co.—Ajax Engineering Corp.

AJAX
NORTHRUP
INDUCTION HEATING-MELTING

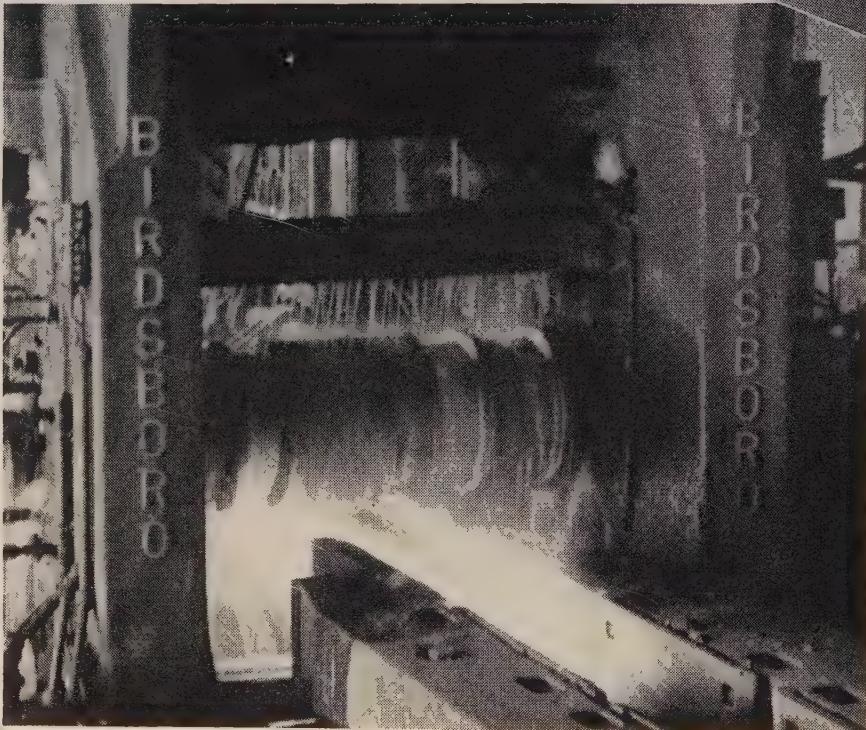
SINCE 1916

**Key to FASTER PRODUCTION from your
Two-High Reversing Mills . . .**



BIRDSBORO

*alloy
steel rolls*



Designers and Builders of:

STEEL MILL MACHINERY
HYDRAULIC PRESSES
CRUSHING MACHINERY
SPECIAL MACHINERY
STEEL CASTINGS
Weldments "CAST-WELD" Design
ROLLS: Steel, Alloy Iron, Alloy Steel

Gear your production to the outstanding performance of Birdsboro Alloy Steel Rolls . . . and see what a profitable difference it makes. Birdsboro is a recognized leader in designing and building both rolls and two-high reversing mills. That's why it pays to call in a Birdsboro roll specialist.

R13-55

BIRDSBORO

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We put our knows to your grindstone

Ever since the first man-made abrasive was trademarked CARBORUNDUM, outstanding research developments in grinding wheels have consistently come from the laboratories of THE CARBORUNDUM COMPANY. The development of a new grinding wheel by CARBORUNDUM is a care-

fully controlled scientific process... involving three to five years of research, engineering, and field trials. New resinoid bonds are constantly being developed for wheels that will grind cooler, cut faster and last longer, even on the new "miracle metals" and alloys. That's

why your CARBORUNDUM Distributor or salesman offers the finest, the most complete lines of wheels you can buy...made by The Carborundum Company, Niagara Falls, New York. In Canada: Canadian Carborundum Company, Ltd., Niagara Falls, Ontario.

Through product quality and application "know-how"

CARBORUNDUM

REGISTERED TRADE MARK

continually puts more **sense** in your abrasive **dollar**



All belt and two yards wide

(Guard lifted and coolant flow stopped to reveal belt action.)

PHOTOGRAPHED AT BELL AIRCRAFT CORPORATION.

86 inches wide, in fact—by 138 inches long...*all* belt! Here's why: to generate taper of the required precision on huge aluminum aircraft "skins," conventional milling methods were far too slow and costly. So CARBORUNDUM abrasive engineers, in collaboration with the Air Force,

Bell Aircraft Corporation, and the Hill-Acme machine people, designed and produced this special belt, in proper gradings to meet the rigid specifications of surface finish and dimensional accuracy.

● If you are stymied by an unusual grinding problem, turn to the source

with the greatest experience and application "know-how" in the abrasive field today! Call in your CARBORUNDUM Distributor or salesman, or write The Carborundum Company, Niagara Falls, New York. In Canada: Canadian Carborundum Company, Ltd., Niagara Falls, Ont.

Through application "know-how" and product quality

CARBORUNDUM

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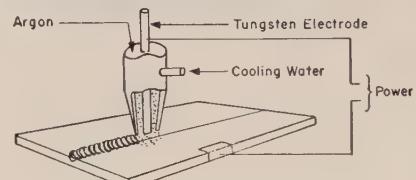


Sound Welds in 33 Seconds ...by HELIARC Welding

Each of the six appendages of these 52S aluminum aircraft manifolds is HELIARC welded to the tubular main section in from 20 to 45 seconds . . . The spatter-free, flux-free HELIARC welds need no cleaning or finishing—costs are kept at a minimum.

The parts are aligned in a special jig, and tack-welded in position using a lightweight HELIARC HW-9 torch . . . The finished welds are made while the parts revolve on an electrically operated turntable controlled by a foot-switch. Since each weld is completed in less than a minute, production rates are high . . . Here are some of the advantages of HELIARC welding:

- Joins nearly all commercial metals including non-



ferrous and high temperature alloys.

- Heat highly concentrated within the area of the weld minimizes distortion.
- Makes all type joints in all positions on metals .020 in. and thicker.
- Portable manual equipment, and semi-automatic and automatic units for all job needs . . . Semi-automatic hand-guided HELIARC welding attains speeds up to 50-in. per minute.

Start saving now—call your local LINDE representative for more information and ask for Form 7942, "Modern Methods of Joining Metals."

Linde Air Products Company
A Division of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N.Y.

Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY
Division of Union Carbide Canada Limited, Toronto

The terms "Linde" and "Heliarc" are registered trademarks of Union Carbide and Carbon Corporation.

Linde
Trade-Mark

**MACHINING COSTS
CUT 40%**

...ON JET RINGS

By switching to flash butt-welding of extruded sections, we helped one customer cut fabricating costs of a jet engine ring from \$67.85 to \$41.93. A saving of \$25.92 per ring — roughly 40%.

This is one of many cases in our files where rolling and flash butt-welding of bars, sections, extrusions or plate has proven to be the most economical and practical method of fabricating circular components. Shown below are some other "American Welded" components.

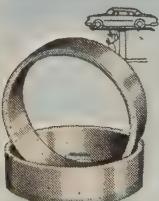
If you require a similar part, it is very likely that this type of fabricating can cut your costs. Why not write our Product Development Division today? They will be glad to study your problem.

THE AMERICAN WELDING & MANUFACTURING COMPANY
110 DIETZ ROAD • WARREN, OHIO

AMERICAN WELDING



WELDING • MACHINING • FABRICATING



MACHINED RINGS

Rolled and flash-welded rings, machined to exact specifications and delivered ready for assembly.



WHEEL AND RIM ASSEMBLIES

Weldment of carbon steel bar and plate for use on heavy earth-moving equipment.



TURBINE FRAME ASSEMBLIES

Formed sheet metal bands and flash butt-welded rings fabricated into a jet engine component.



NOZZLE BOXES
Complicated welded assemblies of machined rings and sheet metal.



COMPRESSOR CASES

Welded band for hermetically sealed refrigerator compressor.



SPECIAL MILL ROLLED SECTIONS

Amweld can show you how to save critical material and valuable machinery time by use of these sections.



MOTOR FRAMES

Steel bars and plate formed and welded into industrial motor frames.



Send for free catalog of American Welding Production Facilities.

April 11, 1955

Metalworking Outlook

GAW: The Play Begins

Watch for the United Auto Workers to use legal legerdemain to end the General Motors Corp. pact on June 1, the same day Ford Motor Co.'s agreement terminates. As it stands, the GM pact would end May 29. The move would keep the pressure equalized on both companies, reasons UAW, and would give it a bargaining advantage. Formal Ford talks are scheduled to start Apr. 12. GM parleys were slated to begin Apr. 7. Detroit rumor: A "deal" on GAW will involve an extension of the now-common contract clauses regarding call-in and severance pay.

GAW: In Farm Equipment, Too?

The UAW will seek the annual wage for farm equipment workers, too. Negotiations begin this month—the auto union represents some 125,000 in the industry. It may represent even more before long because several locals of the old Farm Equipment Workers, notably the 5000-member Local 101 at International Harvester Co.'s Chicago tractor division, have voted or intend to merge with UAW. Steelworker President David J. McDonald backs the autoworkers' drive for the annual wage. If they win it, he says, "that'll make it so much easier for us in 1956."

Vance Will Study Titanium

Harold S. Vance, chairman of the executive committee of Studebaker-Packard Corp., will study the whole titanium situation for Dr. Arthur S. Flemming, defense mobilization director. Mr. Vance will try to find out what has gone wrong with the demand for the metal. His appointment follows a threat of at least two Capitol Hill inquiries and a genuine concern in the planning agencies over reports that the Air Force no longer encourages contractors to use the metal.

Steel Quarterly Earnings Good

First quarter steel earnings will be good. Crucible Steel Co. of America earned approximately \$2 million in the period, compared with \$529,926 in the same 1954 months. Crucible estimates second quarter results will be about the same as the first. Third quarter returns will be down, but fourth quarter results will be better than the third three months. Sharon Steel Corp. expects sales of about \$38 million in the first quarter, compared with \$24 million in the year-ago period.

Matter of Mergers

A full-scale merger hunt is gathering steam in Washington. The motivation is partly political, because the issue has been attractive ever since Theodore Roosevelt demonstrated how it could be used to win votes. But there's genuine concern, too, in the administration—and in industry. The

Metalworking Outlook

Federal Trade Commission has appointed a 13-man task force to give a fast yes or no on merger proposals. The FTC will issue a broad report on the merger trend late this spring. A Senate Judiciary Subcommittee has \$200,000 to investigate antitrust statutes.

Losses in the Northwest?

The Pacific Northwest may be losing forever its chance to grow industrially. Cheap power, the area's sales feature, has turned into an Achilles heel. Constant bickering as to whether power should be privately or publicly owned has led many a company to by-pass the region in considering new sites. The slack of some years ago in power consumption has been taken up, and there's little left for new business. Only about 11 per cent of the area's industrial potential has been developed. Natural gas may help, but not until 1957. The big potential still rests with undeveloped water power.

Tool, Die Imports Climb

Tool and die shops are concerned about the growing volume of work coming in from western Europe. European-made molds for use in plastics can be delivered in Chicago at 60 or 70 per cent of the domestic price. The mold tariff is 14 per cent of the cost abroad, not the sales price.

Another Look at Reserve Tools

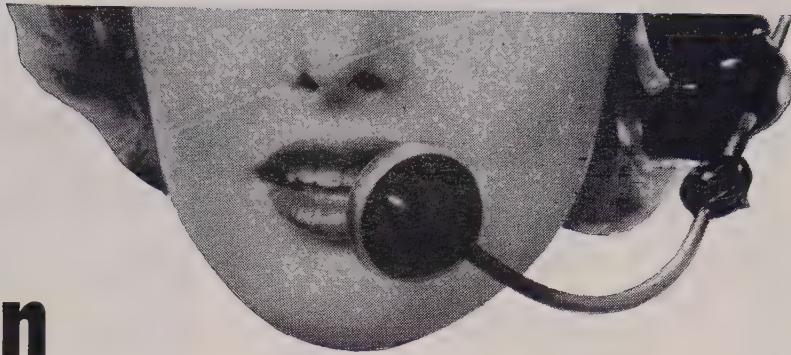
The National Industrial Reserve is surveying its machine tools to eliminate those with purely military application. NIR also wants legislation to permit the military to lease for up to five years idle U.S. production equipment essential for the mobilization reserve. Tools found to be of use only to the military would be transferred from the reserve to one of the services. It could then sell or scrap the equipment if not needed.

Straws in the Wind

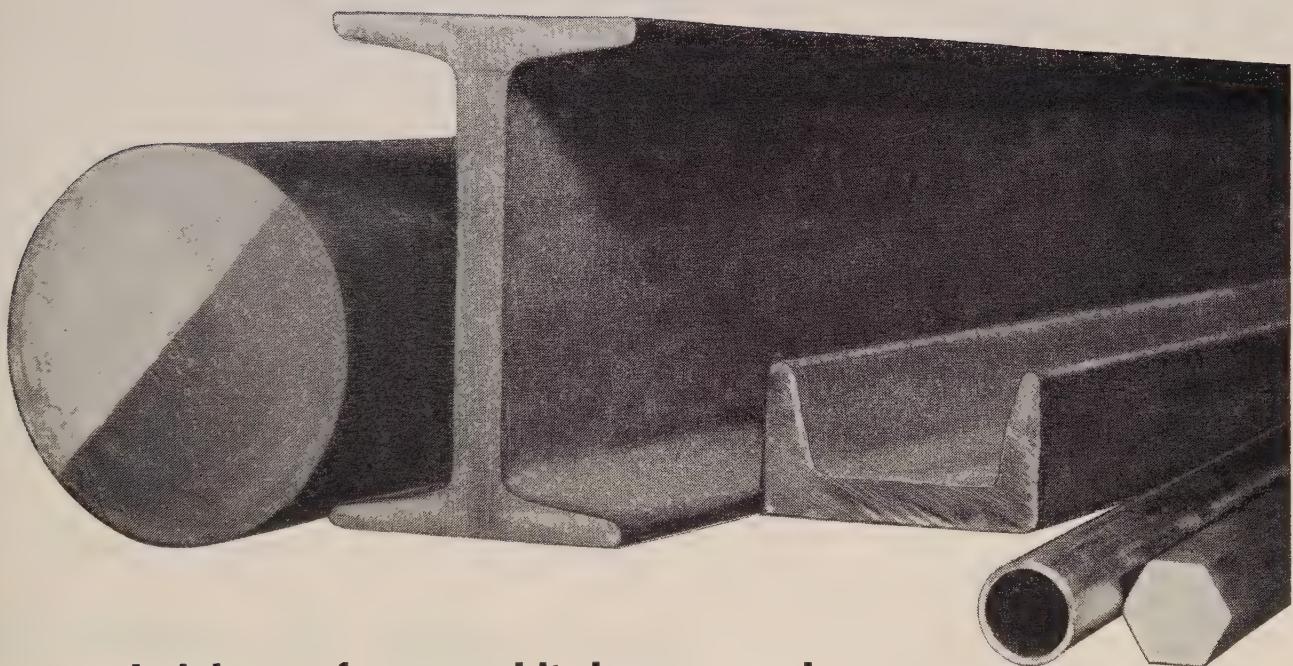
The big 20,000-ton extrusion press, eliminated from the heavy press program two years ago, is again under study by the Air Force . . . M. A. Hanna Co. expects to produce 4 or 5 million lb of nickel this year at its two-furnace operation in Oregon; some 300,000 lb was turned out last year . . . Pickands Mather & Co. is considering a joint venture with Steel Co. of Canada to develop the old Bristol Iron Mine, 50 miles north of Ottawa . . . The New Haven Railroad will buy a Talgo train from ACF Industries Inc. for about \$1 million.

This Week in Metalworking

Metalworking has a \$2.8-billion stake in housing (p. 65) . . . Porcelain enameling sales are shinier (p. 67) . . . U.S. Steel Corp. will promote more consumer buying to boost demand for its steel (p. 68) . . . Machine tool builders are hanging a lot of their sales hopes on the show coming up in Chicago next September (p. 69) . . . Trade association membership is rising (p. 70).



call Ryerson for steel carbon, alloy, stainless



Quick delivery from world's largest stocks

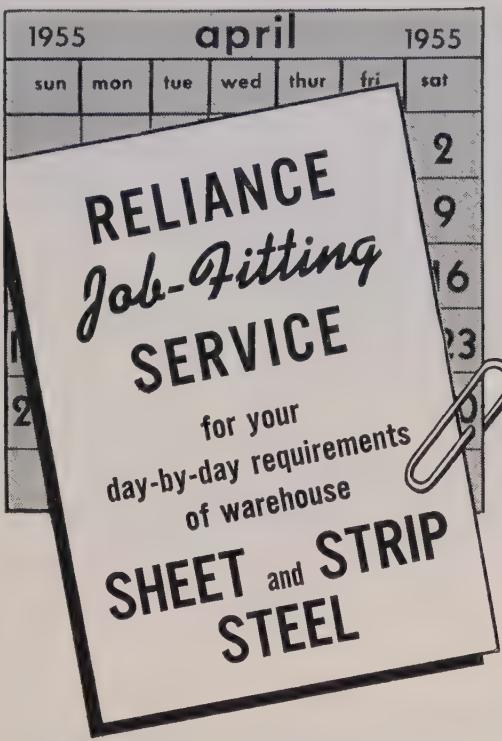
Whether you need a single piece or a truckload you can depend on prompt, personal service from your nearby Ryerson plant. So, for every kind of steel—when you need it—call Ryerson.



RYERSON STEEL

Principal products in stock: bars, structural, plates, sheets, tubing, alloy & stainless steel, reinforcing, etc., also machinery & tools

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND
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COLD ROLLED STRIP STEEL

Coils • Cut Lengths • All Tempers

SHEETS

Cold Rolled • Hot Rolled • H.R. Pickled
Galvanized • Long Terne
Standard or Production Sizes
Sheared or Slit to Actual Working Dimensions

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ON THE JOB PERFORMANCE . . . 98.769%

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WHAT DOES IT PROVE?—That in the long run, DSC STRIP consistently meets or beats recognized standards for strip performance, when the tools, the job and the steel are properly mated.

How about putting us to the test?

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GENERAL SALES OFFICE—DETROIT 9, MICHIGAN

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Low and Medium Carbon Manufacturers' Wire High Carbon Specialty Wire
Aluminum Cable Strand Reinforcement Rope Wire Tire Bead Wire
Welded Wire Fabric



April 11, 1955

Everybody's Business

The reports and recommendations presented to Congress by the Commission on the Reorganization of the Executive Branch of the Government—the Hoover Commission—should be of vital interest to everyone.

The U.S. government is the free world's biggest enterprise. It got that way via the New Deal and World War II. Federal civilian employment in 20 years has grown from 600,000 to 2.3 million. In the process, the government's organizational structure has become adorned with a multitude of costly lean-tos and shanties in the form of agencies, bureaus and functions. Even the White House has its advisory and staff expert appendages.

Since the first Hoover Commission completed its work in 1949, many of the changes it suggested have been carried out. Others were laid aside and forgotten. Some areas of activity were off limits to it.

The second Hoover Commission, with extended powers, picked up the assignment of its predecessor in October, 1953. Its 13 task forces were recruited from the ranks of outstanding men in business and industry. Their findings, sometimes reading almost like fantasy, would fill a dozen library shelves. For example:

Governmental inventory records are largely nonexistent, but the value of surplus property alone is reliably estimated at \$155 billion. That's more than half the national debt, now averaging \$6800 per family.

The government engages in 1500 activities competitive with private business. Each year businessmen spend \$1 billion answering federal questionnaires, most of which are filed and forgotten—at additional warehouse expense. Federal loans, guarantees and insurance have grown to \$244 billion.

You will want to study the reports already out on paper work, personnel and civil service, transportation, lending agencies and medical services. Important ones coming up are on legal procedures, use and disposal of surplus property, procurement, business organization of the Defense Department, water resources and power, real property and subsistence services.

As might be expected, the minority benefiting from governmental benevolence is resisting change. The majority favoring economy and efficiency in government will need to voice its opinions to Congress.

You are a shareholder in this sprawling enterprise. Protect your investment by making its business your business.

Irwin H. Such

EDITOR



Why you can get quick action on steel-making questions at Inland

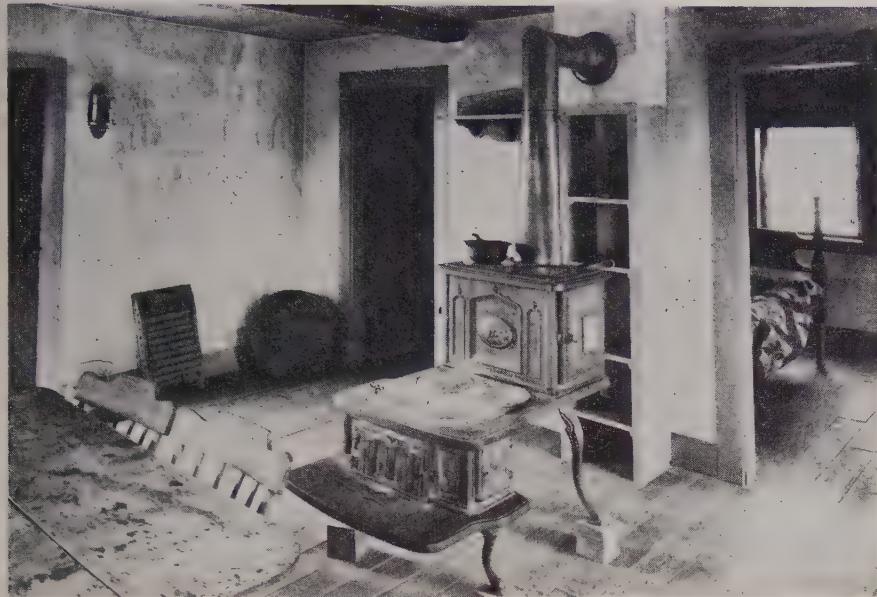
When your steel problem needs a prompt answer, you can get it at Inland where all the men who make decisions are quickly available. Like the top men in sales, steel manufacturing, quality control, raw materials and traffic pictured here.

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Davenport • St. Louis • Kansas City • Indianapolis
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Principal Products: Sheets • Strip • Structural
Shapes • Plates • Bars • Tin Mill Products • Rails
and Track Accessories • Coal Chemicals



Then: Metalworking's share per home was about \$20 . . .



Crane Co.

Now: Streamlined kitchens emphatically point up . . .

Metals' Growing Stake in Housing

How long will the product you're making today maintain its market replacement potential? The wood burning range has been around a long time—when it was the rage, metalworking's total investment in a new home probably amounted to less than \$20, compared with an average \$2300 today. Though the market's declining, there is still a demand for about 98,000 wood and coal burning stoves annually, Sears, Roebuck & Co. says. Strictly a mail order item, the stoves range in price from \$28 for a cast iron one to a \$90, deluxe, enameled job with a window in the oven door—a not-so-old feature on modern gas and electric ranges.

HOME BUILDING offers a real challenge to metalworking. The ultimate, of course, is the all-metal home. Although Lustron Corp. failed, it proved that the all-metal home can be built and sold. In fact, U. S. Steel Corp. now has one under development.

Metalworking is active on the entire home front. Take a quick check of the metalworking involved in the "packaged" home offered in the real estate section of your Sunday paper: Kitchens equipped with every major appliance made, steel cabinets, two baths, aluminum combination storm doors and windows, etc.

Potential — The growing popularity of the "packaged" home helped provide metalworking with an estimated \$2.8-billion market from last year's 1.2 million housing starts. When you consider that's an average of \$2300 per new home built, the potential of that market comes into focus.

In the average \$20,000 home, \$2300 covers little more than the cost of necessary metal products—plumbing, bath and kitchen fixtures, heating and ductwork, electric wiring and downspouting. The metalworking bill for many of the subdivision-type "packaged" homes going up in suburbs climbs to about \$4500!

Full Picture—Major appliances and fixtures are only part of metalworking's stake in home building. Radio, television, air conditioning, small appliances and housewares all fit into today's market.

How long will the building boom last? Some claim we're overbuilding already because housing starts are running above family formations. In Dallas recently the Federal Housing Administration put a tentative brake on some credit, pending a survey of housing supply and demand.

More Growth — Most factors, however, including the Federal Reserve Board's annual consumer poll, point to continued high-level home building. According to FRB's survey, 9.6 per cent of consumers interviewed in 12 cities plan to buy or build new homes in 1955—the largest percentage in

any year since the poll began seven years ago.

One thing is certain: The amount of metalworking going into a new home will continue to increase.

Metals Gain—New metalworking products—like television and air conditioning—are constantly being developed. Metal is making rapid inroads into traditional uses of wood like window casements, storm doors and windows. A good example of the latter is in the furniture industry. The National Association of Furniture Manufacturers reports that 17 per cent of the furniture made today is metal. The Commerce department says metal furniture manufactured last year was worth \$355 million.

It is difficult to draw a percentage comparison between household products going into new homes and those which are replacements. John L. Holloway, president of Crane Co., Chicago, says his company's replacement market is about 25 per cent greater than its new home market.

Wooing—But the product itself is an important factor. For example, it's believed that at least half of all dishwashers sold go into new homes. On an over-all basis, estimates on the percentage of household products going into new homes are somewhat lower, ranging from 30 per cent to 50 per cent.

Much of the momentum for metalworking's gains in the home-building market has been sparked by appliance makers who woo builders as well as buyers. A contributing factor, too, is that the home buyer can get his "packaged" appliances in his mortgage—payments are less noticeable that way.

Contests—During May and June, Hotpoint Inc., Chicago, is going after the home building market with a \$5-million consumer contest. Over 150 builders in the nation are erecting models of Hotpoint's "living conditioned" homes as part of the campaign. Getting into the act, too, will be electric utility companies, department and furniture stores.

A real pace setter in homes is aluminum. Pots and pans were the first stronghold. Now appliances are using more of the light

metal. Aluminum Co. of America officials say the use of aluminum in stoves has doubled in the last three years. The industry also is bidding for a bigger share in heating ductwork, doors, windows and downspouting.

Pots and Pans—Each new home is a potential market for a new set of houseware. Companies like Aluminum Goods Mfg. Co., Manitowoc, Wis., are following the appliance makers' pattern of wooing builders. Housewares generally are not included in the "packaged" home, but you'll find them on display in many model homes.

Probably the most important factor in the home building market, one plumbing fixture manufacturer states, is the potential replacement market. It's a problem getting more research and development time and money. Appliances and houseware traditionally have carried the "lasts-a-lifetime" emphasis. Trouble is, many housewives have kept them that long.

Trade-Ins—Today's appliances will last as long as any of the older models, but manufacturers are taking cues from automakers. "We can't hope to get the public trade-in conscious every two or three years like the auto people," commented one executive. "But through use of color, 'built-in' features for modern architecture and general equipment improvements,

we can make obsolescence a factor long before the appliance is worn out."

New Construction Needed

Water and sewerage improvements costing \$25 billion over a ten-year period are needed to meet the nation's expanding growth.

Estimates by the Departments of Labor and Commerce show \$10 billion in construction is needed to catch up on the accumulated backlog. The remaining \$15 billion is required to offset obsolescence and depreciation and keep pace with increased use and population growth.

To provide these utilities means average annual spending of \$2½-billion. Recent outlays have been at a record rate of slightly over \$1 billion.

Steel Plants Take Big Gulp

Slaking the steel industry's thirst requires water at the rate of nearly 6 million gallons every minute. So states the American Iron & Steel Institute on the basis of a recent Bureau of the Census survey.

In 1953, the top steel production year, blast furnaces, steelworks and rolling mills used 3108 billion gallons. About 55 per cent of this water was recirculated back into surface water sources, often purer than when it was received.



Home Building: Takes a Heap of Metalworking*

Heating system	\$840 million
Eaves & downspouting	48 million
Plumbing & fixtures	900 million
Electric wiring & fixtures	24 million
Steel kitchen cabinets	61 million
Major appliances	930 million
Total	\$2,803 million

*Estimated sales of material and equipment, but not including installation labor, for the 1.2 million homes built in 1954.



General Motors Corp.

Porcelain Enamel Sales Shine

AS THE APPLIANCE industry goes, so goes porcelain enameling. Ranges, washers and refrigerators are major consumers. Some freezer and dryer models also use it.

Factory sales of those five appliances dropped 5 per cent in 1954—to 11.4-million units, compared with 12.1 million in 1953.

Institute Reports—The Porcelain Enamel Institute (PEI) estimates that the total dollar volume of porcelain enamel products sold in 1954 was: Appliances, \$173 million; building products, \$102 million; industrial equipment, \$31 million; others, \$64 million.

It is anticipated that this year's total will reach a somewhat higher figure than the \$370 million posted last year. Sales estimates (see chart) for the five major appliances affecting porcelain enam-

el show: 1. Refrigerator production will go from 3.3-million units to 3.4 million this year. 2. Freezers, which were unexpectedly weak in 1954, will go from 975,000 to over 1 million units. 3. Dryers will pass the million mark for the first time.

4. Washers will hit a total of 3.4 million this year, increasing over the 1954 total of 3.2 million. 5. Ranges will increase slightly to about 3.2 million.

Good News—Architects, engineers and contractors have shown increased interest in curtain-wall-type construction for commercial and institutional buildings. Numerous porcelain enamel curtain-wall buildings are under construction. Many others are on the architects' drawing boards.

The outlook for new equipment in the food processing and oil refining industries, the largest industrial users of porcelain enamel, is excellent, PEI reports. Demand for porcelain enamel plumbing fixtures, hot water tanks and light reflectors is also up due to the high construction rate.

Schools, hospitals and shopping centers are still moving upward, and will continue to do so even if home building dips.

Remodeling by established stores also is becoming a competitive necessity. New store fronts, better lighting and modern refrigeration for air conditioning are projects which will help increase the demand for porcelain enamel.

Two Problems—Porcelain enamel manufacturers face two serious problems: Their product is used on appliances which have reached a high level of saturation. About 70 per cent of the refrigerators, washers and ranges sold are replacements, and the percentage is expected to increase. Secondly, active promotion by aluminum, stainless steel and new paints is affecting porcelain enamel sales.

As the first quarter closes, cautious optimism is the byword of the porcelain enamel manufacturer.

Major Appliances Affecting Porcelain Enamel Outlook

(Factory Sales in Thousands of Units)

	Refrigerators	Freezers	Washers	Dryers	Electric Ranges	Gas Ranges
1955*	3400	1010	3400	1050	1060	2100
1954	3305	975	3225	897	1008	2020
1953	3491	1090	3437	698	1143	2212
1950	5849	890	4289	318	1602	3046
1947	3194	607	3784	58	1044	2464

*Estimated

Porcelain Enamel Institute

U.S. Steel Courts Housewife

Advertising dollars spent at the consumer level mean more steel sales, the corporation finds. "Operation Snowflake" will be used as the model for full-scale campaign

SELL THE FINISHED PRODUCT to sell steel: The concept is paying big dividends for U. S. Steel Corp., Pittsburgh.

"Operation Snowflake," the company's first venture into this type promotion, was so successful that it is being followed up by a full-scale campaign through the rest of this year.

Next Drive—On Apr. 19, U. S. Steel will launch "Operation Wife-saver." Taking advantage of the springtime urge to refurbish the home, all-steel kitchens will be pushed. The company's products will be featured in national advertising in which other kitchen manufacturers will participate. Some 13,500 retailers have asked the corporation for promotional material.

Also planned for spring is "Operation Shower," a retail-level promotion of stainless steel flatware, portable appliances and other steel gifts for potential June brides. U. S. Steel will contact 150 manufacturers and thousands of hardware dealers and department stores in this drive.

Food Promotion—A third campaign will begin before July 4, to promote sales of canned food. Working with canmakers, U. S. Steel will push quick, easily prepared dinners in cans. About 10,000 supermarkets will participate.

The steelmaker's market development division, working with advertising men, plans to round out the year with a repeat "Operation Snowflake." Following last year's pattern, its purpose will be three-fold: To sell steel in competition with other consumer products or services, to sell steel in competition with other metals and to sell the corporation's product.

Joint Effort—The first two goals will be shared by steel fabricators. They will join in the campaign as they did last year. Some 79 appliance makers echoed the corporation's "White Christmas" slogan in their advertising. More than 150 utility companies also participated,

benefiting through increased electric consumption.

Payoff—More than 95 per cent of distributors quizzed by U. S. Steel reported a direct boost in sales over the previous year after the concentrated campaign. A gas company in eastern Massachusetts installed 112 water heaters in December as a direct result of Operation Snowflake. A Los Angeles salesman sold 46 appliances in December, 1953. His sales jumped to 103 appliances last year. A Chicago distributor reported that his sales climbed 150 per cent over the previous year's.

"We benefit two ways from these campaigns," the corporation's promotion managers explain. "By adding to steel consumption, we build the total market, and by increasing customer's business, we sell U. S. Steel."

U. S. Lists Key Men

About 20,000 key engineers are being assembled on a "Finder's List" by the Engineers Joint Council, New York. It will help locate engineering talent in national emer-

gencies. The list will be part of a master check of scientific and technical personnel requested by the government. Some 8000 top men already have been selected from among the nation's 500,000 engineers.

Not Enough Diemakers

Growing manpower shortages in the contract tool and die industry threaten the rapid build-up of production needed in an emergency for national defense, industry representatives recently told officials of the Business & Defense Services Administration and other governmental agencies.

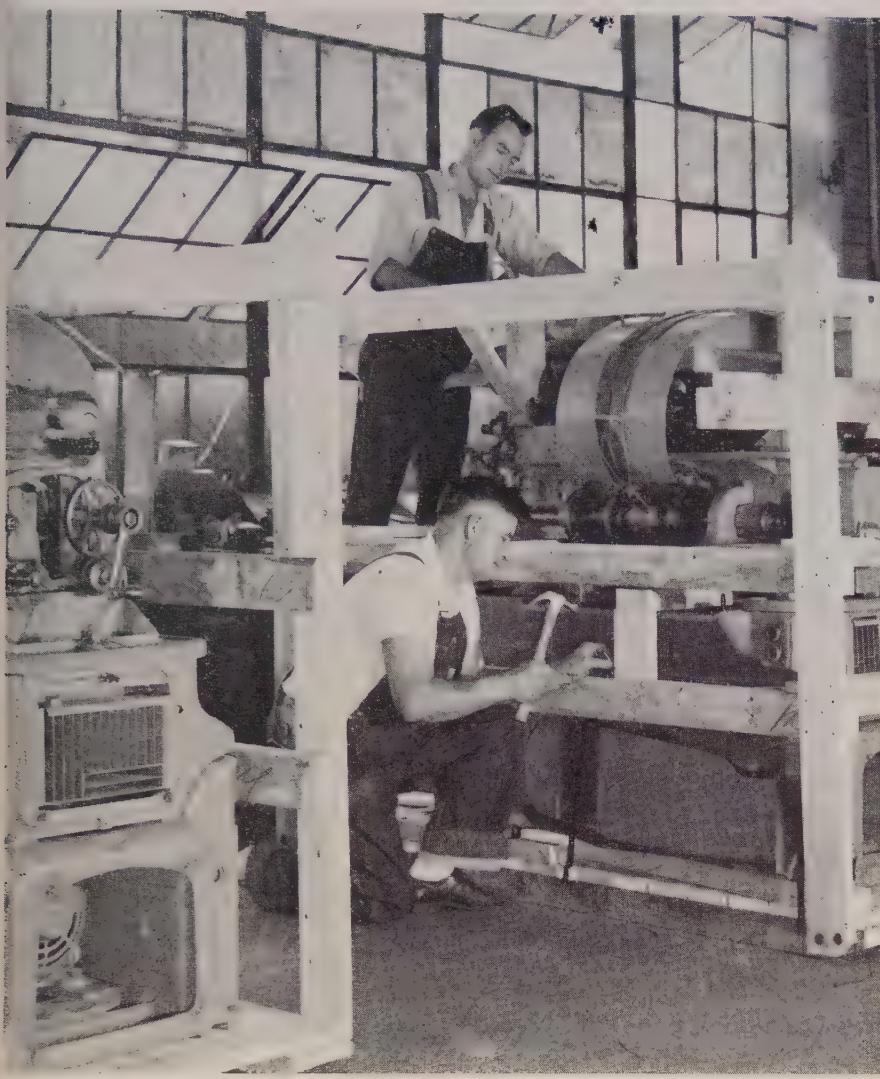
Largest single factor causing the shortage, manufacturers say, is the lack of proper apprentice programs. In some areas, it was stated, labor contracts are a factor. In the Detroit area it was declared that only one apprentice was allowed for every 15 journeymen until two years ago when a new contract cut the ratio to one for every eight. This ratio also is considered inadequate.

At the present rate of training tool and diemakers, the industry in 25 years would have only one-third the number it has today.

Spokesmen for the industry also emphasized the need of continuing draft exemption for apprentices, as well as a better understanding of the need for tool and diemakers in the nation's economy.



Beginnings of a new look in steel sales: "White Christmas" promotion



Brown & Sharpe Mfg. Co.

Machine tool builders get set for Chicago. This year . . .

The Show's the Thing

MACHINE TOOL builders are determined to make their 1955 show surpass any they've ever had.

Billed as "the World's Best Investment in Action," it is all set for a two-week run, Sept. 6-17, at the Chicago International Amphitheatre on the stockyard grounds. Sponsored by the National Machine Tool Builders' Association, it's expected to draw 200,000 top industrial executives, production men, engineers, designers, research and development men.

Precedent—It's the first exhibition to be held by the machine tool builders since 1947. That show, held in the Dodge-Chicago plant, saw 175,000 visitors (preshow estimate, 100,000) place millions of dollars worth of business right on

the floor. Records show ten Cleveland builders went home with \$5 million in new orders—one got \$1.5 million of them, and sold \$150,000 worth of exhibit machines.

Equally important, the fourth quarter of 1947 showed a higher level of machine tool business than its predecessor. Much of the credit was given to interest generated at the September show.

Goal—There's little doubt that this year's show will surpass its successful predecessor in almost all the record departments. Two reasons: First, metalworking itself has grown 83 per cent since 1947—is almost certain to send more representatives to the show, do more business on the floor and after. Second, machine tool design and

application have improved more drastically in the last five years than in any other comparable period in history.

The two factors add up to this: An estimate of 200,000 visitors is not overly optimistic, perhaps a shade light.

Influence—Effect of the machine tool show historically is to stimulate business in several industries. First, of course, builders get orders at the show, plus the noticeable, but incalculable, number which follows. They are stimulated by the interest and information received at the show.

This boost in business results directly in orders for plants supplying the machine tool or the machining industries. They include foundries, tool and die plants, carbide makers, steel mills and the makers of gages, motors, controls, gears, etc.

Back Home—Visitors will have several things in mind. Production men will be looking for faster, better ways to turn out their products. Quality control men will be looking for new ways to hold closer tolerances in production. Engineers will interpret new equipment and techniques in terms of new shapes or combinations for their products.

No visitor will be able to see all the show in the time allotted. He'll have the 160 exhibits at the main show to see, plus those at the Production Engineering Show at Navy Pier—it will feature accessories, instruments and equipment.

More Fast Write-offs Granted

Certificates of necessity for accelerated tax amortization on 31 new or expanded facilities (value: over \$65 million) were issued by the Office of Defense Mobilization.

One certificate went to Cleveland Cliffs Steamships Co., Cleveland, to repower *the Pontiac*. Cleveland Cliffs is replacing present boilers with a one-boiler unit and is installing a new oil-burning turbine. Request for the certificate was made in January. A 70 per cent allowance of a certified amount of \$2 million was granted. *The Pontiac* will sail about the middle of May.

Other certificates of necessity went to railroads for freight, refrigerator, tank and passenger cars and diesel locomotives.

Trade Associations: How They're Growing

	ALL NATIONAL ASSOCIATIONS	METALWORKING ASSOCIATIONS*	BUSINESS POPULATION
1955	1700	450	4.2 million
1950	1500	400	4 million
1930	900	180	3 million
1910	250	50	2 million

*Estimated by STEEL. Other figures: Commerce Department

Trade Groups Come of Age

Associations are gaining in membership. Their staffs and budgets are larger; their services more extensive. It all adds stature to an institution unique to America

THE NATIONAL Screw Machine Products Association had a 10-percent gain in membership last year. The economic slump in 1949 prompted some 10 per cent of its members to drop out.

That is news. Nearly all the other 450 metalworking associations (see table) have had similar experiences. Membership waned in 1949 as it had in almost every slump in the last half century. Last year was an exception.

Significance—Trade association executives hail the reversal in the membership trend as proof that associations have reached maturity. One member of the Gray Iron Founders' Society, who dropped out in 1949, rejoined a year later and remained in during 1954, says: "Most of my competitors stayed in GIFS in 1949 when I quit. They seemed to get a lot out of it. I decided to stick with it this time."

There are more reasons for sticking with an association now than in 1949. Trade groups offer some 100 services today, compared with about 60 then. Their permanent staffs, budgets and programs are larger, too.

Proof Positive — A survey of more than 150 national manufacturing associations showed an average budget of \$152,000 in 1954. The low was \$25,000; the high, more than \$1 million. Some 15 per cent of those 150 had budgets

exceeding \$250,000. The average staff consisted of 11 persons, but one group had 135. Dues, however, had not increased markedly. They average \$1 per \$1000 of sales.

For those dues, your association will probably offer you at least 15 basic services—information on business facts and problems, conventions and conferences, help on governmental relations, sales promotion of the industry's products, help on general labor relations, industry statistics, commercial research, industrial research, cost accounting surveys, standardization service, aid on financing and collection problems, commercial arbitration among members or between members and customers, advice on industry legal matters (although no association can or does practice law).

Growth—George Eaton, executive secretary of National Tool & Die Manufacturers Association, believes that associations have made their greatest gains in the last five years by providing statistical and industrial research services for their members. C. J. Judkins, chief of the Commerce department's Trade Association Division, believes that the major benefit derived from such groups is the pooling of know-how.

Associations got their start because of governmental encouragement. During World War I,

Bernard Baruch as head of the War Industries Board, urged companies to form mutual associations so he could better deal with them. Herbert Hoover, the co-father of the movement, developed the idea still further, when he was secretary of commerce in the 1920s. He maintained it was the most practical way for the government to deal with the then more than 3 million independent businesses in the U. S. That argument holds even greater weight today—there are 4.2 million separate businesses.

The world's largest industry, metalworking, has the world's largest number of trade associations, 450. Five years ago less than 30,000 metalworking firms belonged to at least one trade group. Today, membership approaches 35,000.

West Sees Metals Show

Thriving western industry was treated to its second major metalworking show in three weeks as the American Society for Metals staged its Western Metal Congress & Exposition in Los Angeles—the other was the American Society of Tool Engineers' exposition.

The five-day show was held in the West's largest exhibit hall, Pan-Pacific Auditorium. More than 32,000 guests registered to visit the booths of 360 exhibitors.

Target—The show, aimed directly at western industry, required a shotgun technique to hit its broadly diversified target. Exhibits showed components for the electronics industry, materials handling equipment, a 17½-ft aluminum alloy die forging, an 8500-lb steel forging, new fabricating techniques, tools for the petroleum industry, an array of testing and inspection equipment, plus tooling and machine tools for all types of metalworking.

Running concurrently was a five-day program of technical sessions. They were sponsored by the ASM, the American Welding Society, Society for Nondestructive Testing, American Foundrymen's Society and the Industrial Heating Equipment Association.

The stage is already set for the next ASM western show. It's to be in March, 1957.

Capitol Hill: Antitrust Battle Looms

Attorney General Brownell's committee to study antitrust laws has submitted its report. Recommendations are being greeted with mixed emotions

CURRENT FACTS

THE BATTLE'S ON. Attorney General Herbert Brownell's National Committee to Study the Antitrust Laws has reported.

Included in the 394-page report are nine recommendations for legislative changes in antitrust laws and four requests for legislation falling outside basic antitrust laws.

Market Control — In the one dealing with labor, the committee said: "To the extent that such commercial restraints not effectively curbed by either antitrust or the Labor-Management Relations Act exist, then we recommend appropriate legislation to prohibit these union efforts at outright market control." The other three recommendations relate to minor revisions of the Defense Production Act and the Trademark Act of 1946.

Turmoil — Congressional "friends" of small business are up in arms. Most frequently heard protest: Adoption of the committee's recommendations will weaken the antitrust structure.

Some committee members feel the same way. J. M. Clark, economist, says: "I agree with other committee members that the net effect of the combined proposals tends toward an undesirable weakening of the antitrust laws."

"Investigate Committee" — Rep. Wright Patman (D-Tex.) is demanding an investigation of the Attorney General's committee, charging it is a "high pressure private lobby operating under White House sanctions." One committee recommendation is to amend the Robinson-Patman Act of 1936.

While the report is not to be considered as the sentiment of the administration, Attorney General Brownell says: "This is an important document that will be a landmark in the preservation of American free enterprise."

COMMITTEE RECOMMENDATIONS

1 Legislation should be passed to repeal the Miller-Tydings amendment to the Sherman Act and the McGuire amendment to the Federal Trade Commission Act. It should subject resale-price maintenance, and other price-fixing practices, to those federal antitrust controls which safeguard the public by keeping the channels of distribution free.

The committee points out that "Fair Trade" pricing can extinguish price competition. If a distributor has mostly items of this type, he is completely free from the pressures and tribulations of price competition. This, says the report, is at odds with the most elementary principles of a dynamic, free-enterprise system.

2 Section 3 of the Clayton Act, which makes price discrimination a criminal violation under certain circumstances, should be repealed. Committee report states: "Such drastic legislation threatening common and competitive pricing practices with the risk of criminality, if tolerated at all, should be accessible only to the government which already has sought to limit its application."

3 The United States, when its property rights have been damaged by antitrust infractions, should have a right to recover damages.

4 Amendment of the Federal Trade Commission Act to reduce the penalties for noncompliance with FTC orders from \$5000 a day to \$5000 a violation.

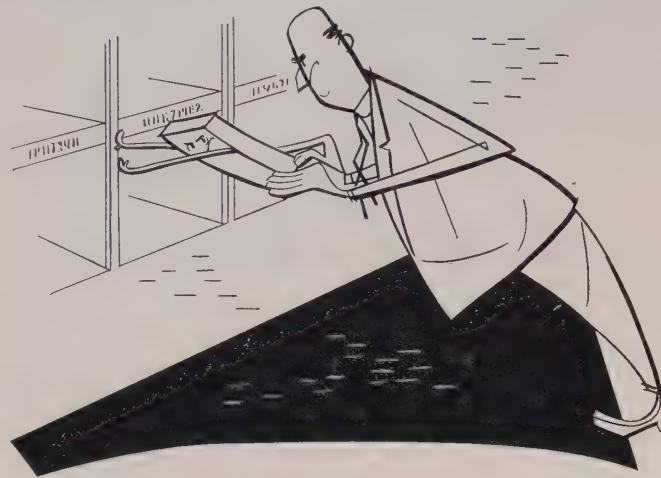
5 The trial judge should decide on double or triple damages. In all instances, this would recompense injured parties. Beyond compensation, the trial court could then penalize the purposeful violator without imposing the harsh penalty of multiple damages on innocent actors.

6 Section 4 of the Clayton Act should be amended to provide a four-year statute of limitations.

7 Amendment of section 2(c) of the Robinson-Patman Act: This "brokerage" clause is at odds with broader antitrust objectives, says the committee. It is recommended that legislation be introduced to restore the original vigor of the exception "for services rendered." This would insure equal treatment of all types of distribution.

8 Criminal penalties should be increased from \$5000 to \$10,000 on each count of a criminal indictment.

9 The Attorney General should be authorized to issue a Civil Investigation Demand.



Classification: SIC Changes Coming

■ A LIGHTNING ROD manufacturer wrote to Washington asking to have his firm classed officially as a producer of electronic equipment rather than as a maker of ornamental metalwork.

Why such a request? The lightning rod producer wants to get materials in case of war. He thinks his position will be enhanced as an electronic equipment producer in the federal government's Standard Industrial Classification system.

Revered—This demonstrates the reverence with which many industrialists look upon the federal government's Standard Industrial Classification system. When the SIC was set up in 1939, it was intended to be only an aid in obtaining uniformity and comparability in the presentation of statistical data collected by agencies of the federal government, states, trade associations and private research agencies.

But many people have come to look upon the SIC as something that could be used in wartime to determine the essentiality of an industry.

Big Job—Because of the great importance attached to how you are classed in the SIC, the current job of revising it is monumental. A lot of people have to be consulted and satisfied. This first major review of the SIC has been under way three years, and it will be next year before final action is taken on any changes.

Suggestions for changes origi-

nate with industry. Co-ordinator of the work is the privately sponsored Advisory Council on Federal Reports. The U. S. Bureau of the Budget has the last say on any changes.

Up for Review—Undergoing first review is major group 34. It covers fabricated metal products. First review of major group 33 (primary metal industries) is completed.

Major review of the SIC, says the Bureau of the Budget, is necessary to recognize growth, changes and refinement in industry. The present SIC of manufacturers has been unchanged since 1945, and the SIC of nonmanufacturers since 1949. The Budget bureau's hope is a review every five years.

Hot Scrap

■ To export or not to export steel scrap from the U. S. has set up such a ticklish situation that the Commerce department referred the matter to the Council on Foreign Economic Policy.

Scrap brokers want to export, and the government feels obliged to see that our allies get what scrap they need. The steel industry in the U. S. is opposed. It doesn't like competition for scrap, contending that exports drain away this country's supply of high-grade metallics.

Until the council, chairmanned by Joseph M. Dodge, comes up with a solution, the export policy on iron and steel scrap will remain unchanged. It's the one that be-

came effective Mar. 7 (see STEEL, Mar. 14, p. 149).

Capital Chatter

- Secretary of Commerce Sinclair Weeks will spend nearly a month in Europe promoting world trade. He'll leave Apr. 21.

- The Atomic Energy Commission established a division of licensing and appointed Harold L. Price as director. He has been the commission's deputy general counsel.

- Americans interested in business ventures in Ecuador may apply for guarantees protecting their investments against losses from inconvertibility or expropriation, the Foreign Operations Administration announced.

- President Eisenhower's cabinet committee on transportation is no longer expected to recommend tolls for inland waterways. The committee was deluged with opposition.

- The Commerce department issued a handbook designed to help industry mobilize in case of war. It's "The Defense Materials System in Our American Industry," and is available at Commerce department field offices.



Meet Glenn Hughes: New chief of the Castings Branch of the Iron & Steel Division, Business & Defense Services Administration, Mr. Hughes is on loan to the government from Ohio Steel Foundry Co., Lima, O. He's assistant sales manager of the firm's Springfield division. Ohio Steel Foundry has been his employer for 16 years.

High pressure no problem



SIRVIS-CONPOR PACKS IN A BIG PUSH

Got a high pressure problem? Maybe we can help. Chicago Rawhide's Conpor impregnated Sirvis leather packings are doing an outstanding job at pressures up to 10,000 psi. They are insoluble in most hydraulic fluids and are compatible with a wide range of other oils, solvents and gases. Sirvis-Conpor packings do not score cylinders, do not "chatter." The impregnations have no true melting point and will operate from as high as 225° down to -65° F. Sirvis-Conpor packings have high tensile strength, excellent resiliency, and operate without undesirable leakage. No other sealing material combines these advantages with long service life at such low cost. Let C/R engineers show you how to solve your hydraulic and pneumatic sealing problems with Sirvis-Conpor packings.



Send for "Report on Conpor." Write A. S. Berens,
Chicago Rawhide Mfg. Co., 900 N. State St.,
Elgin, Ill.



CHICAGO RAWHIDE MANUFACTURING COMPANY

1301 Elston Avenue SIRVIS DIVISION Chicago 22, Illinois

Other C/R products

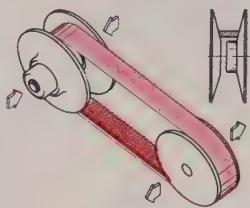
OIL SEALS: Shaft and end face seals for all types of lubricant retention and dirt exclusion • SIRVENE: (Synthetic rubber) diaphragms, boots, gaskets, and similar parts for critical operating conditions • SIRVIS: Mechanical leather packings and related products.

They have what it takes

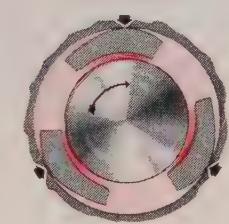
to reduce your centerless grinding costs



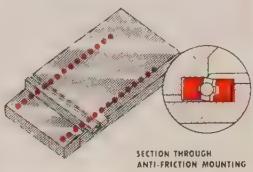
Smooth regulating wheel drive through variable pitch sheaves; infinite number of speeds, handwheel selected and tachometer indicated.



FILMATIC grinding wheel spindle bearings are still the best in the machine tool industry; no fuss, no bother.



Precision anti-friction slide under regulating wheel unit; split-hair dial adjustment is translated precisely to in-feed movement.



CINCINNATI

New

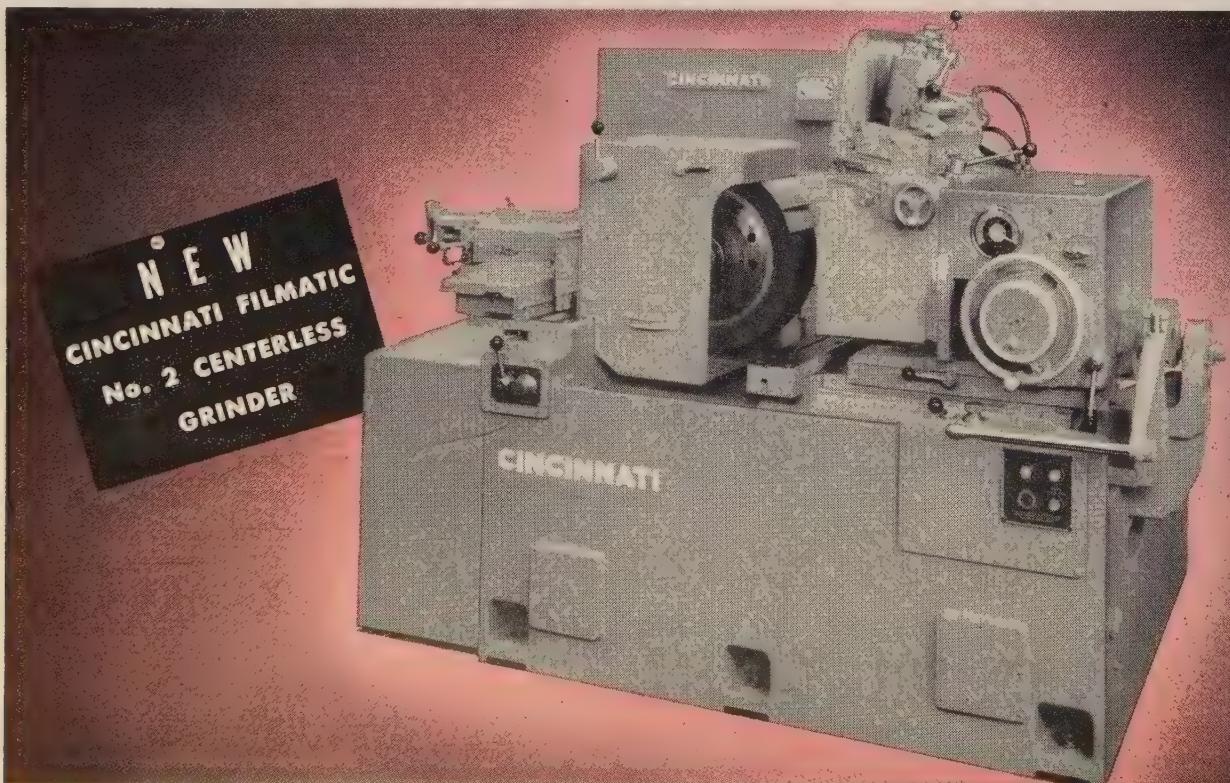
CINCINNATI FILMATIC No. 2 CENTERLESS GRINDING MACHINES

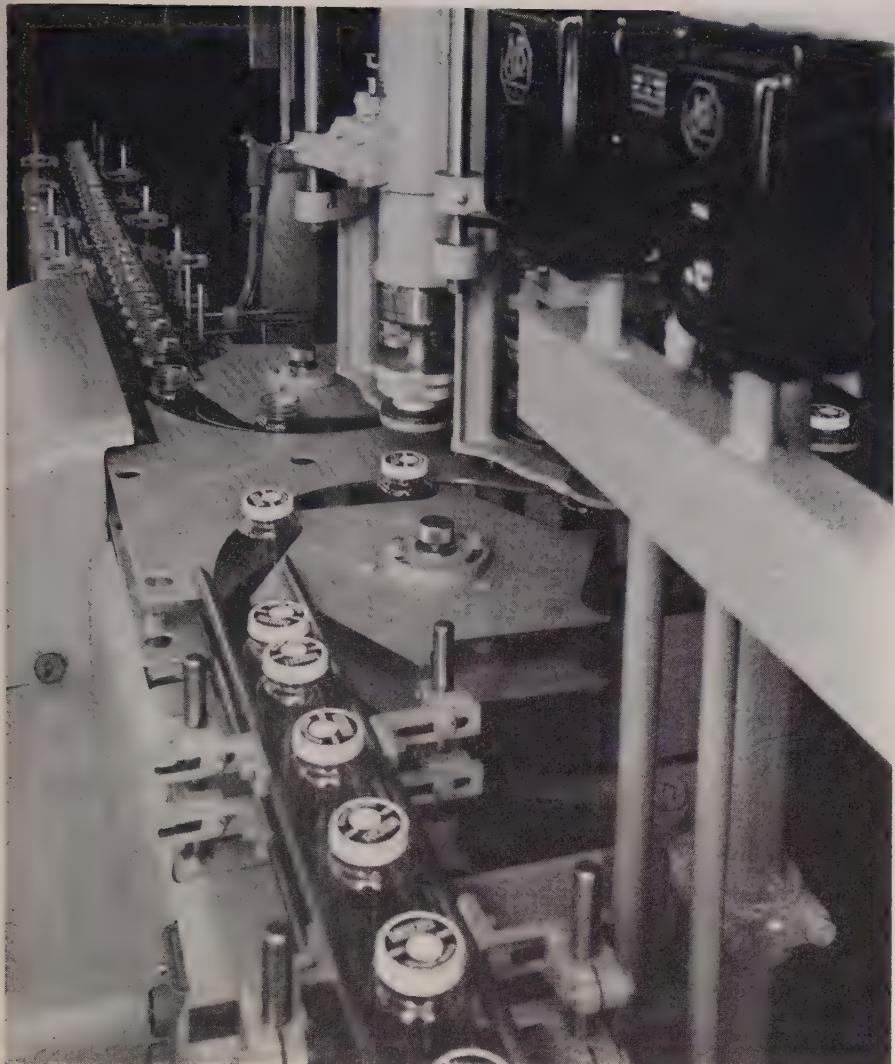
Thirty-three years of experience in centerless design and application has gone into the new CINCINNATI FILMATIC No. 2 Centerless Grinder. You will find it more accurate, more versatile than ever before. Time-proved Cincinnati advantages have been retained . . . bed-rock grinding wheel spindle mounting; FILMATIC grinding wheel spindle bearings; double slide construction between bed and regulating wheel housing; simplified method of truing regulating wheel. And now these additional advantages are included . . . infinitely variable regulating wheel speeds; pre-loaded, precision ball bearing lower slide; pressure lubrication of regulating wheel spindle bearings; stabilized infeed screw. Of course, many more features desired by centerless grinder users are incorporated in the new CINCINNATI FILMATIC No. 2 Centerless Grinder. Would you like to know more about them? Write for new catalog No. G-644.

CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO



CENTERTYPE GRINDING MACHINES • CENTERLESS
GRINDING MACHINES • CENTERLESS LAPING
MACHINES • MICRO-CENTRIC GRINDING MACHINES





Pneumatic Scale Corp. Ltd.

Machinery worth \$160 million will be sold in '55 to assure . . .

Packaging for Profit

AUTOMATIC PACKAGING machinery makers are wrapping up sales estimated at \$160 million a year. The industry is one of the few that didn't slide last year, and sales are still on the way up. It would be hard to find better prospects for growth.

Pressured by rising costs, both consumer and industrial goods packagers are keeping the 70 major designers bent over their boards with their plants full of orders. Demands for more efficiency and higher speeds make the machines grow old fast, assuring a substantial and growing replacement market.

Performers—American Machine & Foundry Co.'s first cigaret pouch packer was built in 1908.

It turned out 45 packs a minute. Today's best machines make a pack, fill and seal it at a rate better than 9000 an hour. With electronic instrumentation and other modern control features adding new dimensions to performance, obsolescence is getting new impetus.

Most automatic unit packaging machinery is custom built. Engineering changes are often needed to put even a standard machine to work. In their attempts to crack the big industrial market, however, makers are shooting for more flexibility. Some new machines have quick-change operating heads, and can be switched from product to product with minimum setup time.

Industrial Market — Problems are still far from solved. Leading users of unit packaging machinery are the food and pharmaceutical industries, where runs in the hundred millions are commonplace:

L. Kosinski, of Lamson & Sessions Co., Cleveland, a fastener manufacturer, remarks that there's nothing he'd like better than a machine that would do his packaging for him automatically. Although his department puts out 20,000 packs of fasteners in an average day, he can't find a machine that will beat his team of girls. The most modern units aren't versatile enough to handle the different shapes, sizes and weights of fasteners and packages with runs of less than 500,000.

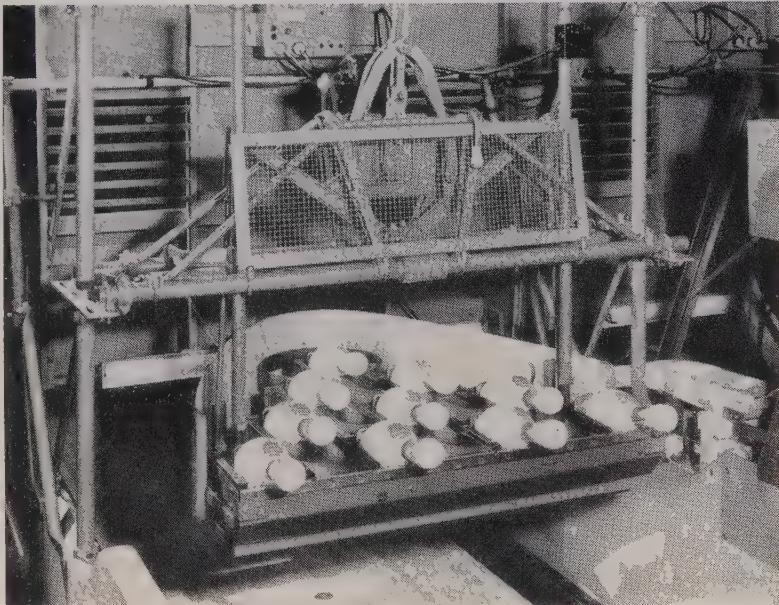
Redesign — The situation isn't static. Industrial producers look at the low unit packaging costs of the food industry with envy, and there's a growing movement to meet the packaging machinery designers halfway by more standardization of product and package.

General Electric Co., producing more than 200,000 products, maintains an industrial packaging laboratory to correlate research, testing and development, and is attempting to increase use of machine packaging. Socony-Vacuum Co. has cut its packaging costs by review of its products line and reduction of former 166 product sizes and 154 variations in label printing. Keystone Brass & Rubber Co. Inc. has developed a program using vacuum-formed plastic containers for many products.

Me, Too—As with retail products, modern industrial merchandising is directing increased attention to the package. There's a growing practice of designing product and package at the same time. Warehousing, inventory and shipping programs are getting another look with a view to tying them to the packaging bundle.

The American Management Association estimates that packaging costs run industry about \$10 billion a year. Unit packaged materials account for only about \$2.5 billion of this total. There's a lot of room for the packaging machinery industry to grow while the gap is being closed.

McGILL BEARING BRIEFS



CAMROL CF bearings ADD TO SAFETY of 22,000 Brunswick-Balke-Collender semi-automatic pinsetters now in use

When the pinboys "set 'em up in the other alley" a McGill CAMROL Cam Follower helps them do the job without danger to themselves or damage to the pin-setting machine.

Known as the B-10 Semi-Automatic Pinsetter, this machine is a product of The Brunswick-Balke-Collender Company and is in use on 22,000 individual bowling lanes throughout the world.

In these machines the CAMROL CF bearing is used in the safety latch mechanism to lock the cam action and prevent the machine from recycling during pin setting. Used by the company for 4 years, the CAMROL bearing has given no trouble despite the literally millions of cycles these 22,000 machines have been operated.

CAMROL Cam Follower bearings utilize a full complement of small

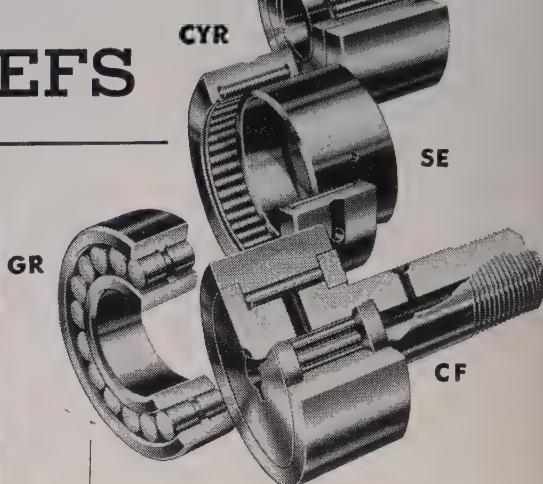
diameter followers with outer race and integral stud and flange custom heat treated for the ultimate in radial and shock load capacity.

Precision tolerances on all grinding surfaces with simplified lubrication minimizes internal wear and increases bearing life. Both starting and running friction are reduced to a minimum.

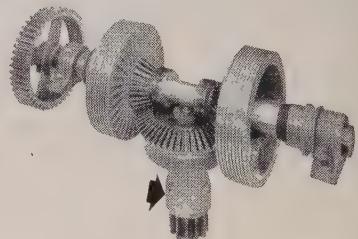
McGill designed and built the first Cam Follower and used 20 years of experience with thousands of applications to perfect the right Cam Follower for any cam action application.

BEARING SELECTION GUIDE

A revised 140 page Bearing Selection Guide, complete with 30 pages of vital engineering data, has been released by the McGill Manufacturing Co. Ask for Catalog No. 52.

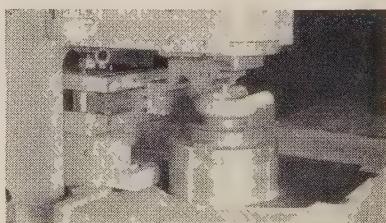


**CAMROL CF BEARING USED
from BEGINNING of PRODUCTION
by SCHIELD-BANTAM COMPANY**



More than 5,500 cranes and excavators built by Schield Bantam since 1945 use CAMROL CF Bearings in SHIFTING COLLAR vertical swing shafts and drum clutch applications. With maintenance negligible and performance excellent the manufacturer asserts, "Using CAMROL CF Bearings offers an overall price advantage and insures maximum product quality."

**PINES PRESSURE DIE HOLDER
PUTS up to 18,000 POUND LOAD
on CAMROL CYR BEARING**



Pines Engineering Co., Inc., has used the CAMROL CYR Bearing for 6 years in tube bending machines and has never had a failure. The bearing takes the full bending moment in Pines pressure die holders that bend extra heavy pipe in sizes ranging from $\frac{3}{4}$ " to 4" without scratching the tubing.



MCGILL design leadership has given you these important developments

- ★ First full type roller bearing
- ★ First guided full-type roller bearing
- ★ First Cam Follower roller bearing
- ★ First sealed roller bearing

McGILL MANUFACTURING COMPANY, INC., 301 N. LAFAYETTE ST., VALPARAISO, INDIANA



Jones & Laughlin Steel Corp.

New types of steel containers pave way as . . .

Barrel Makers Beat Sales Drum

THINGS look brighter for makers of steel shipping containers. One reason: Improvements in organic coatings are boosting applications.

The Department of Commerce reports that in January 2.6 million steel shipping barrels and drums were purchased. Livingston Kepplinger, president, Steel Shipping Container Institute (SSCI) says that demand for steel shipping barrels for the first two months of this year was about 5 per cent ahead of January and February, 1954.

Spirits Brighten—This is good news for an industry which has been faced with a gradual production decline since 1951. The drop has been due, in part, to the pe-

troleum industry, which is: 1. No longer buying large quantities of drums for foreign operations. 2. Using more pipeline facilities. 3. Has experienced a dip in offshore refined products business.

Petroleum is still the leading user, receiving 45 per cent of all drum shipments—a 7 per cent decline since 1950. Defense order curtailments also have affected the sales picture.

Looking Ahead—Container producers are guardedly optimistic in discussing this year's sales trends. Paint, food and miscellaneous consumers should need more containers this year than last. Chemical consumption, which now accounts for one-third of the total drum

sales, has increased by 10 per cent over the 1950 average. It is anticipated that demand will continue to increase. Petroleum producers, disappointing customers last year, expect a 5 per cent increase in over-all activity this year. This may mean more drum purchases.

New Processes—Nearly any product, including metalworking items, can be successfully shipped in steel. While few organic-coated containers were used six years ago, they now constitute about 25 per cent of the total.

New resins with resistance to corrosion and chemical attack are also widening potential drum applications. Steel shipping containers are carrying such assorted products as printers ink, cosmetics, service containers for airplane parts and cement.

Competition—Rivalry from wooden shipping containers is dwindling, but fiber containers are being used more frequently for shipping dry products. While applications for stainless steel and aluminum are small, the light metal producers are making barrels for breweries and the petroleum and chemical industries. The lightness and corrosion resistance of aluminum are big advantages, but high initial cost is holding down applications.

Steelworkers' Earnings Rise

Buying power of the hourly earnings of steelworkers climbed 18.5 per cent from 1949 to 1954 to hit a record annual level. "Real" hourly earnings showed a further increase in January, says the American Iron & Steel Institute.

The production worker in the steel industry enjoyed "real" average hourly earnings of \$1.916 in 1954 (based on 1947-1949 purchasing power). The figure for January is estimated at \$1.986. Preliminary data of the Bureau of Labor Statistics put "actual" average hourly earnings at \$2.27 the same month.

Average hourly earnings of steelworkers have been consistently above the average for workers in all manufacturing industries, the Institute states. In January the spread increased to 43 cents.

for transportation equipment

that stands up...



FLAT-ROLLED STEEL

produced by a specialist

The kids who roll down Oak Hill in a coaster wagon, and those of us who ride in the world's best automobiles, put a lot of faith in flat-rolled steel.

If you use flat-rolled steel in your products, rely on a specialist—Great Lakes Steel. Our entire organization is devoted to the business of making more and better flat-rolled steel for every application. Many manufacturers have found we have some unique qualifications to help them to improve products and reduce costs.

We would like the opportunity to work with you on your problems.

Call on our 25 years of specialization in flat-rolled products. Our representative will be glad to discuss your particular needs at your request.

Great Lakes Steel

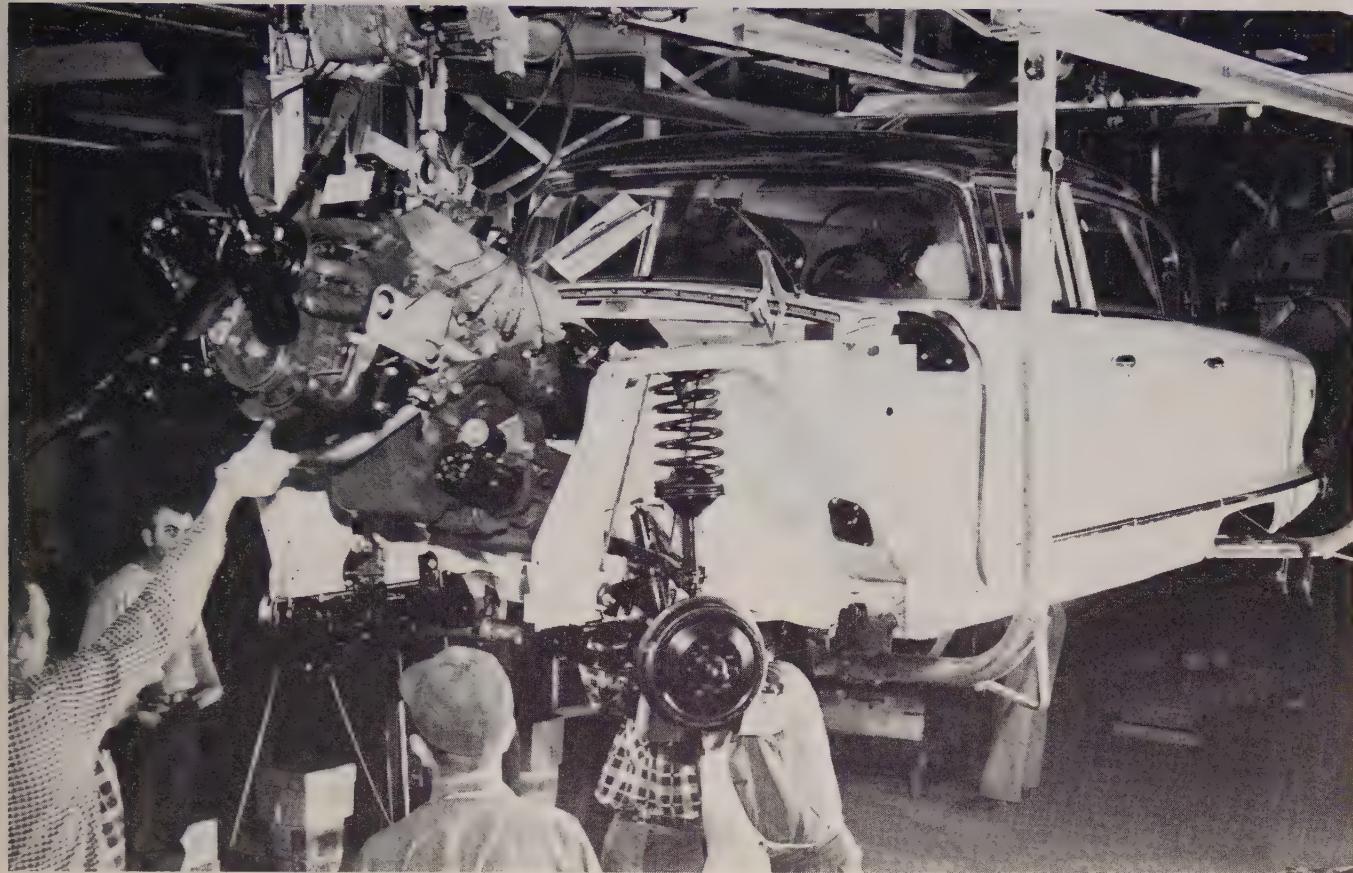
Ecorse, Detroit 29, Michigan

PRODUCER OF N-A-X HIGH-TENSILE STEEL 

UNIT OF

NATIONAL STEEL CORPORATION 

SALES OFFICES IN CHICAGO, CLEVELAND, GRAND RAPIDS, INDIANAPOLIS, LANSING, NEW YORK AND PHILADELPHIA



Ingenious engineering, such as this conveyor, helps as . . .

American Motors' Output Climbs

ONCE UPON A TIME there was a bicycle plant in Kenosha, Wis., which began producing cars shortly after the turn of the century. It still is.

Today, in some buildings which once gave birth to bicycles, American Motors Corp. is making its bid to be the fourth-largest auto producer. Major production of the cars and their components takes place in a group of modern buildings that sprawl leisurely over the Kenosha real estate.

Facilities—The general picture of the Kenosha operation includes foundry facilities producing engine blocks, manifolds and similar castings. There's also a forge shop which produces such items as engine and suspension parts. In one multistory building there's a trim shop making interior panels and seats.

There's a press shop making

some of the smaller stampings up to and including fenders and hoods.

Shuttle System—Bodies of the Hudson and Nash cars are made in Milwaukee and trucked to Kenosha, about 50 miles away. Special trailers haul six bodies per trip.

Bodies of the Ramblers, which American Motors hopes will be its volume line, are built up from sub-assemblies shipped from a Budd Co. plant in Indiana. Assembly is in fixtures which travel an oval merry-go-round. After the lower portion of the body, including the floor pan and channels, is completed, the assembly is transferred to a second merry-go-round. Here, sides and top elements are added to complete what the firm refers to as its "monobuilt" body. Through internal bracing, this means that the frame can be eliminated as a separate member.

Paint—Upon assembly, Rambler

bodies go through conventional metal-finish operations and travel by conveyor to an upstairs paint system where they are painted in prime and solid color coats automatically. Spray guns following tracks that correspond to the body contours accomplish the feat. Bodies are painted in gangs of about ten to the color. Two-toning, if required, is a separate and conventional operation.

Fender and hood painting also is automatic.

Trim—Emerging from the ultra-modern paint system, which is reportedly the first of its kind in the industry, bodies travel by conveyor to the storage area. Ramblers leave by routes somewhat different from other models, however. Bodies from Milwaukee already are partially trimmed. The Rambler bodies are not. Rambler bodies travel down a floor conveyor for trim, while the heavies travel by overhead conveyor, by-passing trim.

At the end of trim, Rambler bodies are picked up by hoists built into the overhead conveyor fixtures, and they take their place for

the rest of the trip through the assembly line. Thanks to the overhead fixture design, the device will handle any of the bodies produced at the plant, giving complete freedom of scheduling. Present output is about 45-per-cent Ramblers and 55-per-cent Hudsons and Nashs. Revamping to increase Rambler capacity is being considered.

Big Change—From the pickup point comes the most noticeable change in the plant since the integration of Nash and Hudson production. Yet that change was not due to Hudson's arrival. It was prompted by the new V-8 engine being supplied in about 25 per cent of the cars produced. This engine must be dropped in from the top in contrast with the former procedure of dropping the body onto the rear axle, driveshaft and rear spring assembly.

Since the rear axle and driveshaft cannot be added until the engine is in place, the body is carried on the new overhead conveyor around a loop in which the V-8 is dropped in from the top. The in-line sixes continue to be positioned from the bottom as before. The only difference: They're dropped up from the bottom instead of the body coming down from the top.

Over, Under—The remainder of



This G model Dodge truck sports a 169-hp, V-8 engine, has a gross vehicle weight rating of 15,000 lb. Note the auto-like styling. Colors are bright, too.

the drive line is then added underneath the car. Cradles are used to position the subassembly.

The most noticeable change in the assembly plant, which might be attributable in part to Hudson production consolidation, lies in an engine plant storage area just added. Nash and Rambler engines formerly were made in the plant and scheduled to the assembly line from a relatively small area. Today, the Hudson Hornet engine and the V-8 engines purchased from Packard have been added and are shipped up from Detroit.

Tooling the Key—Although the new engines were the real change-maker as far as the assembly plant is concerned, the important shift at Kenosha—and the one on which American Motors is hanging its hat—lies in tooling savings to produce these new models.

Actually, four models use the same body shell, Hudson Wasp and Hornet and Nash Ambassador and Statesman. The shell itself was the 1954 Nash beautifully reworked to accommodate the requisite wrap-around windshield. Front quarters for the Hudson are made with dies from the Nash, 1954 jobs, utilizing an insert in the die which is removable for running replacement parts. Grills for both jobs, of course, are new, as well as the Nash front-quarter panel.

Cost Saver—Perhaps most significant is the speed with which the moves were made—from merger to integrated production within a sin-

gle model year. This move, according to George Romney, AM president, cost only \$9 million for the model changeover, compared with an estimated \$24 million had the jobs been done separately.

This is the road by which American Motors hopes to clinch the title of fourth-largest auto producer. It is the first of the Little Three actually to consolidate its product in fundamental production tooling and styling.

For the Future—The production capacity of the firm is not increased by the move as currently operating. Yet, the increased dealer organization and anticipated promotion of the Rambler as a volume car indicate increases are ahead. Also in the cards: A new look at whether to buy or make more parts.

Running at a schedule which is 83 per cent above 1954's first quarter, the firm is programming a 47 per-cent increase over this figure for the second quarter. Having already earned a \$15 million saving, the formula of combine-and-conquer at AM seems to be working.

Dodge Trucks for 1955

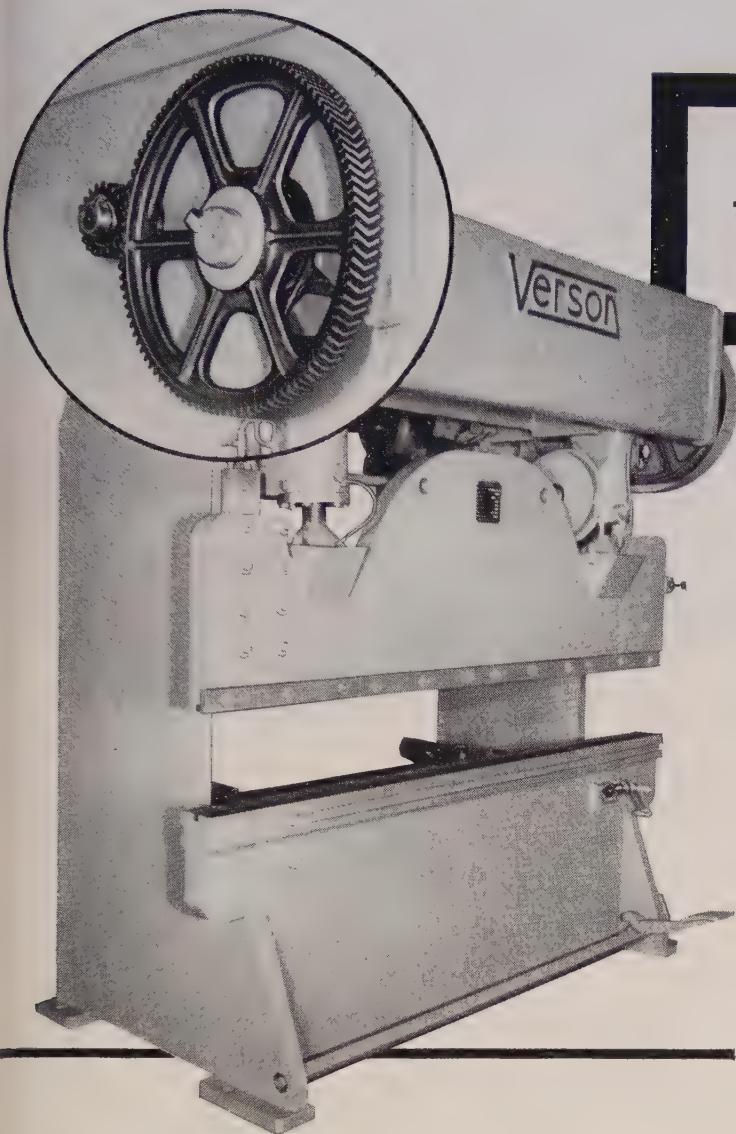
The "forward look" Chrysler Corp. adopted this year also is expanded to its Dodge trucks. Seven engines, with 12 different horsepower ratings up to 202 hp, are available in the vehicles designed to meet 98 per cent of all hauling needs. Gross vehicle weight rating run up to 40,000 lb.

Auto, Truck Output

U. S. and Canada

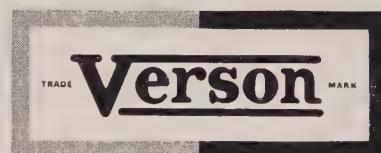
	1955	1954
January	780,780	594,467
February	770,528	574,215
March	920,000*	672,485
April	676,248	
May	621,262	
June	623,732	
July	543,540	
August	523,799	
September	364,441	
October	312,078	
November	616,395	
December	761,954	
Total	6,884,616	
Week Ended	1955	1954
Mar. 5	192,892	139,263
Mar. 12	203,149	143,478
Mar. 19	212,776	154,895
Mar. 26	217,347	149,586
Apr. 2	219,361†	146,498
Apr. 9	217,500*	152,074

Source: Ward's Automotive Reports.
†Preliminary. *Estimated by STEEL.



*These are the features
that make **Verson**^{TRADE MARK}
brakes your best buy*

**HERRINGBONE
DRIVE GEARS
assure long life,
smooth, quiet
operation
with**



PRESS BRAKES

Above is one of the new Verson 300 Series Press Brakes, an exceptional value for medium heavy work. Write for details.



CATALOG B-51 gives design details and specifications on Verson Press Brakes. Write for your copy.

A Verson Press for every job from 60 tons up.

Typical of the advanced design of all Verson machines is the gearing employed in Verson Press Brakes. Drive pinions and gears of all Verson Press Brakes are of the continuous herringbone type. They are produced under strict control in Verson's own ultramodern gear cutting department. Skilled operators using the most modern equipment produce the finest press brake gearing that is commercially available. Before installation, all gears and pinions are matched and checked to operate quietly and smoothly as a pair.

Herringbone gearing is just one of the quality features built into Verson Press Brakes to assure you of the best value. From the thick and deep bed and ram sections to the spring loaded, mechanically actuated shoe type brake, Verson Press Brakes are designed and built to give longer life and better performance in every way.

The Verson Press Brake line is complete—from the smallest to the largest. Whatever your needs it will pay you to bring them to Verson. For specific recommendations, send an outline of your requirements.

Verson^{TRADE MARK}

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Model JR offers

Wide-range Flexibility for industrial radiography

Whether your inspection problems include

- high-quality production radiography of $\frac{1}{2}$ -inch to 5-inch steel sections
- aluminum, bronze, or stainless steel
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- detection of hairline cracks or of microporosity

The model JR is the answer

- with its constant-potential one-million-volt radiation, by means of its 1-mm x-ray focal spot
- with sturdy design requiring no external cooling, no auxiliary apparatus
- well suited for complete transportability or cabinet type installation

Low cost — \$25,000 for x-ray generator, complete controls, and supervision of installation (less mount).

Send for Bulletin JR



The compact control system of the Model JR is portable and easy to operate.



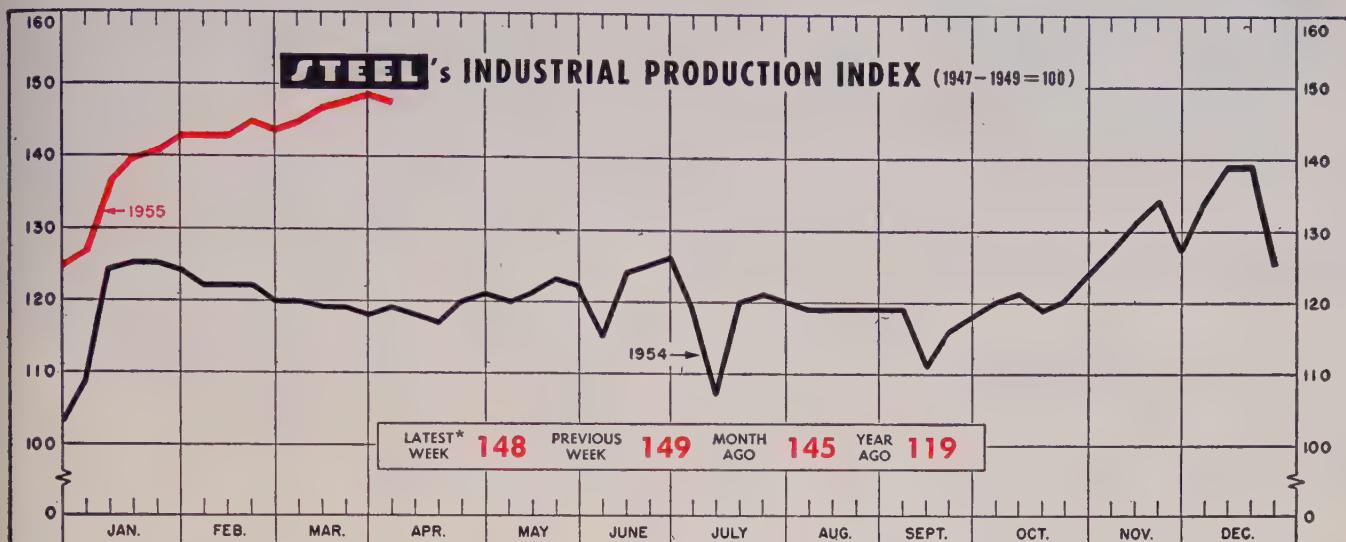
The Model JR can be supplied in a battery operated lift-truck mounting for positioning within the x-ray area without an overhead crane.

Complete lift-truck-mounted model — \$29,600.

HIGH VOLTAGE ENGINEERING CORPORATION

7 UNIVERSITY ROAD

CAMBRIDGE 38, MASSACHUSETTS



*Week ended Apr. 2. Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Auto Assemblies 11%.

More Borrowing Foretells Inventory Build-Up

INVENTORY BUILDING in metalworking is about to begin in earnest. That is, if commercial and industrial loans, usually earmarked for inventory buying, are a clue. They generally fall off in the first part of a year; this year they're going up.

Since a mid-1953 peak of about \$2.4 billion, loans to metalworking dropped to less than half that figure. The slide finally leveled off in the fourth quarter, 1954. For most of this year, gains have been steady from week to week, especially through February and March.

For Example—At the end of January loans were up \$5 million from the beginning of the year. A month later they were up \$64 million, and by mid-March they were \$122 million over the year's start. Taxes may have played a small part in increased borrowing, but don't account for all of it.

In the latest week reported by the Federal Reserve Board, metalworking loans slipped to \$113 million above a year ago. High repayments, usual at this time of year, probably caused the dip.

Build-Up—Inventories have run roughly the same course as loans. A level-off came in the fourth quarter, 1954. A small build-up will be reported for the first quarter (STEEL, Apr. 4, p. 35).

The Commerce department says durable goods inventories in February were little changed for the fifth straight month. A small gain put stocks at \$24.5 billion, up only a little from September's recession low of \$24.1 billion.

More Business—What's happening is this: Some firms have found they need larger stocks to

handle improving business. Others are tired of hand-to-mouth buying and want a "cushion." With a higher operating rate for business in general, inventory building in most lines hasn't had much of a chance.

Indicating some continuing difficulties is a still growing list of unfilled orders. Sales, too, are on

BAROMETERS OF BUSINESS

INDUSTRY

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
Steel Ingot Production (1000 net tons) ²	2,276	2,278	1,622
Electric Power Distributed (million kw-hr)	9,756 ¹	9,907	8,463
Bitum. Coal Output (1000 tons).....	7,910	8,050	6,821
Petroleum Production (daily avg—1000 bbl)	6,868 ¹	6,863	6,486
Construction Volume (ENR—millions).....	\$335.8	\$544.8	\$329.5
Automobile, Truck Output (Ward's—units).....	219,361	217,347	146,498

TRADE

Freight Car Loadings (1000 cars)	641 ¹	639	599
Business Failures (Dun & Bradstreet, no.)	238 ¹	232	267
Currency in Circulation (millions) ³	\$29,738	\$29,719	\$29,701
Dept. Store Sales (changes from year ago) ³	+2%	+14%	-11%

FINANCE

Bank Clearings (Dun & Bradstreet, millions)	\$18,255	\$21,185	\$17,894
Federal Gross Debt (billions)	\$274.1	\$274.3	\$270.3
Bond Volume, NYSE (millions)	\$14.9	\$14.6	\$15.7
Stocks Sales, NYSE (thousands of shares)	14,082	12,377	10,785
Loans and Investments (billions) ⁴	\$84.0	\$84.9	\$79.2
U. S. Govt. Obligations Held (billions) ⁴	\$33.5	\$34.4	\$31.6

PRICES

STEEL's Finished Steel Price Index ⁵	194.53	194.53	189.74
STEEL's Nonferrous Metal Price Index ⁶	235.9	227.4	212.5
All Commodities ⁷	110.5	110.1	110.9
Commodities Other Than Farm & Foods ⁷	115.5	115.5	114.4

*Dates on request. ¹Preliminary. ²Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. ³Federal Reserve Board. ⁴Member banks, Federal Reserve System. ⁵1935-1939=100. ⁶1936-1939=100. ⁷Bureau of Labor Statistics Index, 1947-1949=100.



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- ★ HEAT-TREATED, CASE OR FLAME-HARDENED

You are sure of quality and prompt service when you place your industrial cut gear requirements with SIMONDS GEAR. We produce the full range of sizes in the types and materials you need from your blanks or ours. Let us quote on your next gear requirements.

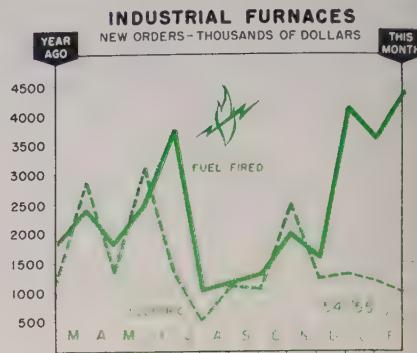
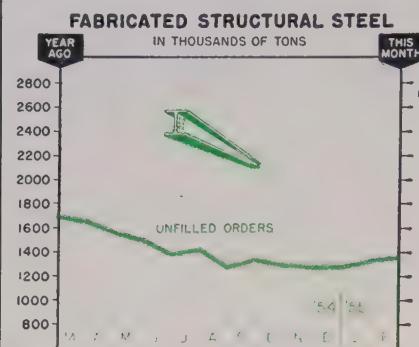
* * *

Stock carrying distributors of Ramsey Silent Chain Drives and Couplings; and industrial V-belts.

SPUR GEARS
BEVEL GEARS
MITRE GEARS
WORMS • WORM GEARS
RACKS • PINIONS
Cast or forged steel,
gray iron, bronze,
Meehanite, rawhide
or bakelite

**THE
SIMONDS
GEAR & MFG. CO.**
LIBERTY at 25TH PITTSBURGH 22, PA.
Quality Gears for over 60 years

THE BUSINESS TREND



	Shipments		Backlogs	
	1955	1954	1955	1954
Jan.	226.2	245.6	1,346	1,686
Feb.	200.5	253.1	1,360	1,697
Mar.	285.4	....	1,645	....
Apr.	293.5	....	1,566	....
May	253.9	....	1,490	....
June	290.3	....	1,391	....
July	265.2	....	1,429	....
Aug.	272.5	....	1,270	....
Sept.	265.4	....	1,329	....
Oct.	258.4	....	1,294	....
Nov.	228.7	....	1,280	....
Dec.	223.5	....	1,281	....
Total	3,135.5	....	1,281	....

American Institute of Steel Construction.
Charts Copyright 1955 STEEL.

	Fuel Fired*		Electric	
	1955	1954	1955	1954
Jan.	3,545	1,865	1,177	1,374
Feb.	4,390	1,753	981	1,093
Mar.	2,346	....	2,828	....
Apr.	1,734	....	1,262	....
May	2,423	....	3,065	....
June	3,724	....	1,261	....
July	987	....	456	....
Aug.	1,117	....	1,052	....
Sept.	1,241	....	1,007	....
Oct.	1,950	....	2,496	....
Nov.	1,534	....	1,196	....
Dec.	4,111	....	1,265	....

*Except for hot rolling steel.
Industrial Heating Equipment Assn. Inc.

the way back up after a brief seasonal dip in January. Scarce buying is an insignificant factor in the increase.

So the outlook is this: Stepped-up attempts to build stocks, thus the borrowing; some tightening of deliveries; a small over-all increase in inventories.

Four-Month Rise for Orders . . .

Pointing up improving business: American Supply & Machinery Manufacturers' Association Inc. says its new order index in February is at the highest point in 22 months. It was the fourth straight month of increase.

The February index is 175.1 (June, 1948 = 100), highest since April, 1953, when it hit 182.1. At its lowest point during the recession, July, 1954, the index was 119.4. Measured by the index are orders received by members who make production and maintenance equipment, tools and supplies sold through industrial distributors.

More Employment Ahead . . .

Another good sign is increasing employment. A Labor department survey of employer hiring plans through mid-May shows increases

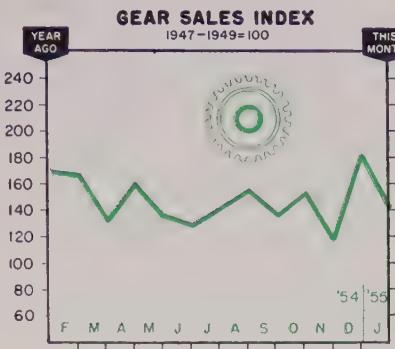
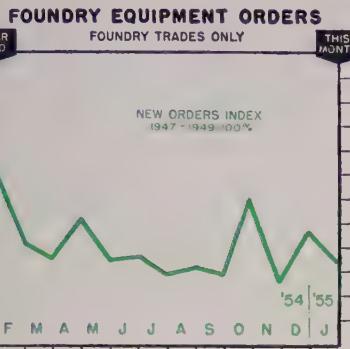
expected in all but 16 of 149 major industrial centers. Most of those expecting drops look for small ones or normal seasonal fluctuations.

Swelling manufacturing jobs have cut unemployment in most locations since the first of the year. Areas specializing in durable goods, particularly auto and steel centers, showed most improvement.

Small gains are expected in electrical machinery, aircraft, household appliances and farm machinery. Shipbuilding and ordnance are expected to continue downward.

Record Breakers Roll On . . .

With auto dealers started on their third million (sales) in 1955, production shows no signs of slackening in coming weeks. Many dealers are reportedly losing sales because they don't have the model the customer wants when he wants it, states Ward's Automotive Reports. Nevertheless, sales in March are estimated at 700,000 units, an all-time record for one month. April sales are expected to hold close to the estimated 29,000 a day chalked up in the last ten days of March.



1955 1954 1953

	1955	1954	1953
Jan.	81.0	173.8	99.6
Feb.	99.9	97.5
Mar.	82.7	132.2
Apr.	125.3	111.8
May	80.8	182.1
June	86.4	156.4
July	68.8	158.9
Aug.	75.6	235.5
Sept.	68.3	127.7
Oct.	147.5	87.1
Nov.	61.4	149.4
Dec.	113.9	160.8

Foundry Equipment Mfrs. Assn.

1955 1954 1953

	1955	1954	1953
Jan.	140.9	167.4	161.4
Feb.	165.1	188.1
Mar.	128.6	158.9
Apr.	158.2	217.1
May	132.5	189.8
June	127.4	146.5
July	141.3	120.7
Aug.	154.7	121.6
Sept.	135.1	135.6
Oct.	152.3	211.1
Nov.	116.7	144.9
Dec.	182.2	194.0

American Gear Mfrs. Assn.

Booming construction also means destruction—to a lot of records. Heavy construction contract awards in the last week of March of \$336 million brought the total for the month to almost \$2 billion, an all-time record for the month, says *Engineering News-Record*. For the first 15 weeks of 1955, contracts are over \$4.3 billion, up 56 per cent from last year and 8 per cent over the previous high of 1953.

STEEL's industrial production index, too, hit a new peak. In the week ended Apr. 2, the index was 149, to conclude the best month on record.

Rail Buying May Improve . . .

Expenditures by Class I railroads for steel and iron products were off over one-third last year, from \$612.6 million in 1953 to \$406.5 in 1954.

The reduction was proportionately split over the major metalworking products railroads buy—track materials, locomotive and car components, including forgings, castings, fabricated and shaped steel.

There has been some pickup in railroad buying over the last few months, but it's early to tell if it

will be sustained over the entire year. The order of any increase will probably parallel rail traffic which is up almost 5 per cent from that of a year ago. A 7.1-per-cent gain will be registered in the second quarter, predict the Shippers Advisory Boards of the Association of American Railroads.

Trends Fore and Aft . . .

"We expect (our) total capital expenditures to be about the same (in 1955) as in 1954," says B. Brewster Jennings, president, Socony-Vacuum Oil Co. Last year, the company spent \$240 million in the U. S. alone. . . . The outlook for new business has shown "definite indications of improvement" in recent months, states H. E. Widdell, president, Arthur G. McKee & Co., designers and builders of steel plants and petroleum refineries. . . . John I. Snyder Jr., chairman and president, U. S. Industries Inc., predicts sales for the now diversified company this year "in excess of \$80 million." His sales forecast is considerably higher than sales in any year prior to 1949 when the company (formerly Pressed Steel Car Co. Inc.) made only freight cars. Car building has since been terminated.



• Edited by GEORGE BLACK

TURBO MIXING IS VERSATILE

Mixing liquids with liquids, solids or gases is one of the most varied and interesting of the unit processes in chemical engineering. A concise discussion of the problems involved appears in the March issue of COOPER ALLOY "NEWS-CAST." Copies on request.



NEW DISTRIBUTORS ADDED

To keep you up to date with our fast growing distribution facilities for stainless steel valves, fittings and accessories, we list below two well known firms who have recently become authorized distributors.

- Standard Brass & Manufacturing Company
705 Milam Street
Beaumont, Texas
- The Cameron & Barkley Co.
160 Meeting Street
Charleston, South Carolina



PUMPING TILE GLAZE

If you've got a tough abrasive slurry to pump, you'll be interested in the fact that a Vanton Buna N flex-i-liner pump with a natural rubber liner is being successfully used to pump tile glaze from drums to storage tanks. Until the Vanton pump was installed continual pump difficulties were experienced.



COOPER ALLOY
CORPORATION • HILLSIDE, N.J.

PREFERRED FOR ELECTRIC FURNACE LININGS IN TWO-THIRDS OF THE NATION!



Permanente PERICLASE Brick for the Steel Industry:

- Permanente Periclase Brick (D-S)
- Permanente Periclase Chrome Brick (PCA)
- Permanente Chrome Periclase Brick (CPA)

Now available! A companion mortar for Permanente D-S brick. High purity periclase composition and maximum workability.

Installation advice on request

Permanente Periclase-Chrome Brick is used to line 70% of all basic electric steel furnaces in two-thirds of the U. S. and in all of Mexico—the area where this superior brick has been available for the longest time.

In all other areas where Permanente Periclase-Chrome Brick has more recently been introduced, it is gaining acceptance at an even faster rate.

Of course, there's a reason. It is simply that the special composition of Permanente Periclase-Chrome Brick has greatly lengthened the life of electric furnace sidewalls—by a minimum of 10% . . . and in some operations even up to 200%.

These performance records are derived from a wide variety of shops melting all types of electric steel. No matter what your operation, Permanente brick should lengthen sidewall life.

Your Kaiser Chemicals sales engineer can give you complete technical details on Permanente Periclase-Chrome Brick, and how it can lengthen the life of your electric furnace sidewalls. He is available to assist you in its proper installation in your electric furnace.

.....

Call or write Kaiser Chemicals Division, Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway, OAKLAND 12, California . . . First National Tower, AKRON 8, Ohio . . . 518 Calumet Bldg., 5231 Hohman Avenue, Hammond, Indiana (CHICAGO).

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Basic Refractory Brick • Ramming Materials • Castables & Mortars • Magnesite • Periclase • Deadburned Dolomite



LARRY DARNELL
... sales mgr. at U. S. Broach



ORVAL W. RIGGS
... Hays Corp. v. p.-sales



EDWARD C. BLOOMBERG
... heads Monarch Aluminum Mfg.

Larry Darnell was appointed sales manager, **U. S. Broach Co.**, Detroit. For the last 11 years he was with **Metro Tool & Gage**, Chicago, as superintendent and later as sales manager.

Scott F. Burton was elected vice president-sales, **Rolled Steel Products Corp.**, Skokie, Ill.

John S. Davey was promoted to vice president of **Russell, Burdsall & Ward Bolt and Nut Co.**, Port Chester, N. Y.

Firth-Loach Metals Inc., McKeesport, Pa., appointed **Harold O. Warnock** chief plant engineer, and **Jack H. Powers** superintendent of x-ray and metallography.

Lawrence F. Boland was made vice president-sales at **Beryllium Corp.**, Reading, Pa.

Emanuel Schugar was made vice president and general manager of **Buffalo Arms Inc.**, Buffalo.

A. V. Finn was elected president and chairman of **Propulsion Research Corp.**, Santa Monica, Calif.

Pacific Airmotive Corp., Burbank, Calif., promoted **William Maxfield** to aircraft division manager, **L. B. Littrell** to vice president-aircraft service, and **John F. Davidson** to assistant to the president and chairman.

Orval W. Riggs was made vice president-sales, **Hays Corp.**, Michigan City, Ind. He was sales manager. **Louis E. Hapke** was made controller.

Robert A. Troman was promoted to sales manager, tower department, equipment division of **Blaw-Knox Co.**, Pittsburgh. He replaces **A. H. Jackson**, now manager of engineering and development.

William M. Williams was made manager of **Chrysler Corp.'s** Detroit tank plant. **Milton B. Porter** was made manager of the Detroit office of the company's west coast automotive operations.

Cullman Wheel Co., Chicago, elected **Norman B. Wienke** president and a director. He also will act as director of sales.

Pittsburgh Steel Co. promoted **Benjamin S. Labeka** to supervisor of specifications and inquiries at its **Allenport, Pa.**, sheet mill division.

Theodore Kauffman Jr. was elected president, **S. Obermayer Co.**, Chicago, succeeding **Theodore Kauffman**, now chairman of the board. **Theodore Kauffman Jr.**, formerly vice president in charge of the Ramrite Division, is succeeded by **George V. Campbell**. **Frank B. Flynn**, in charge of the Obermayer Division, was elected executive vice president.

Edward C. Bloomberg was elected president of **Monarch Aluminum Mfg. Co.**, Cleveland. He succeeds the late **Raymond Deutsch**. Mr. Bloomberg was executive vice president and treasurer.

Herbert J. Arnold was made supervisor of stainless, bar, wire and billet sales for **Crucible Steel Co. of America**, Pittsburgh. Formerly supervisor of stainless steel sales, Cleveland branch, he is replaced by **Frank J. Coates**.

Howard O. Powell was made senior buyer for **Pastushin Aviation Corp.**, Los Angeles.

Clearing Machine Corp., Chicago, appointed **Gordon A. Sommer** to head its new development and research department.

Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif., appointed **Deo M. Blott** technical specialist for aluminum rod, bar and wire products. He will be in Chicago. He was manager of the material fabricating department of **Ritepoint Inc.**

M. Harry Pendergast was elected president of **Air-Way Industries Inc.**, Toledo, O., to succeed **Joseph H. Nuffer**.

New vice presidents at **Independent Iron Works Inc.**, Oakland, Calif., are **James F. Meagher**, Wil-



WILLIAM L. WOLFE
... J&L Supply Div. v. p.-sales



FLETCHER DEVIN
... Cooper-Bessemer v. p.



LEE F. DESMOND
... asst. to president of Dodge Div.

liam Mason, David R. Meagher, John A. Tompkins and William G. Meagher Jr.

William L. Wolfe was made vice president-sales of **Jones & Laughlin Steel Corp.**'s Supply Division at Tulsa, Okla. He was in Pittsburgh serving as assistant to J&L's vice president-sales.

Lunkenheimer Co., Cincinnati, elected **Earl F. Riopelle** vice president in charge of engineering and research, and **Eibe W. Deck** vice president-production. Mr. Riopelle was a vice president, Houdaille-Hershey Corp.; Mr. Deck was a vice president, Wico Electric Co.

Fletcher Devin was elected a vice president of **Cooper - Bessemer Corp.**, Mt. Vernon, O. For the last 20 years he has directed development of the firm's locomotive markets. Currently, he also is district sales manager (Ohio, Kentucky, Michigan, West Virginia and Tennessee) for the engineering and sale of engine-driven compressors. They are used in gas pipeline transmission and refinery service.

Republic Rubber Division, Lee Rubber & Tire Corp., named **Robert A. Hopkins** and **James W. Fullerton** field engineers. Mr. Hopkins is at Kansas City, Mo., Mr. Fullerton at St. Louis.

Lee F. Desmond, general sales manager, was promoted to assistant to the president at **Dodge Division**, Chrysler Corp., Detroit. **Byron J. Nichols** was appointed general sales manager in charge of field operations.

Glenn Evans was appointed to head the task force that will convert the Marion, O., plant recently purchased by **Whirlpool Corp.** from Motor Products Corp. to the production of automatic clothes dryers. Mr. Evans was manager of tooling for Glenn L. Martin Aircraft Co.

Joel Burnette was appointed to **C. O. Bartlett & Snow Co.**'s foundry sales department, Cleveland.

Harold G. Warner was made assistant works manager, **Cadillac Motor Car Division**, General Motors Corp., Detroit.

Charles E. Meluney Jr. was made Houston district sales manager for the electrical wire and cable division of **John A. Roebling's Sons Corp.**

Solar Aircraft Co. named **Bruce A. Willsey** assistant plant manager of its Des Moines, Iowa, plant; and **Clyde Seymour Jr.** manager of manufacturing of its San Diego, Calif., plant.

John C. Scrowcroft was made manager, product research department, in the sales division of **Sherman Products Inc.**, Royal



EARL F. RIOPELLE

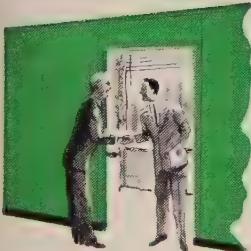
... newly elected vice presidents at Lunkenheimer Co.



EIBE W. DECK



Anticipate change with movable steel walls



Business can't afford to strait-jacket efficiency by the expense, dirt and confusion involved in the relocation of interior masonry walls.

That's why easily installed movable walls made of steel are hailed as the economical way to preserve office flexibility and retain structural stability.

J&L helps manufacturers of movable steel walls build dependability and attractive appearance into these modern

partitions. J&L furnishes the basic raw material—high quality sheet steel.

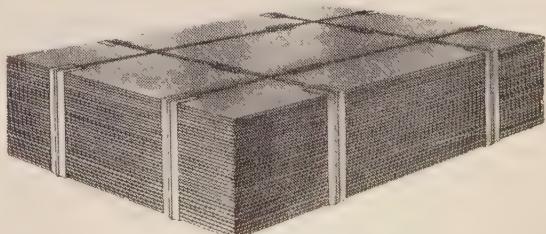
The acceptance accorded J&L Sheet Steel by movable wall builders shows how quality control is coupled with J&L's understanding of product end-use. Thus J&L assures customer satisfaction.

J&L offers you the same quality. Whatever your requirements for formability, uniformity and drawing qualities, you can depend on J&L for sheet and strip steel. Get the best out of your production equipment and add to the value of your finished product.



Jones & Laughlin

STEEL CORPORATION — Pittsburgh



Serving Steel Users Everywhere—linked by water to the Middle West and South



MICHAEL NATOSKI
... Autoyre purchasing agent



ELMER H. WEGNER
... Cleaver-Brooks v. p.-manufacturing



GORDON KIDDOO
... National Research v. p.-development

Oak, Mich. He is succeeded as manager of the sales office by Kenneth Kampman.

Michael Natoski was made purchasing agent of **Autoyre Co.**, Oakville, Conn. He has been with its sales division.

Thomas C. Young was made acting manager of **Lukens Steel Co.**'s commercial research department, Coatesville, Pa.

Earl Hobein was made plant manager of **Berea Rubber Co.**, Berea, Ky. The firm manufactures O-rings for the rubber products division of Parker Appliance Co.

H. E. Brumder was elected vice president in charge of the Downingtown, Pa., operations of **Pressed Steel Tank Co.**

Niagara Blower Co., Buffalo, elected **Martin H. Olstad** vice president-engineering.

Warner T. Carlson was made assistant sales manager and **Harry J. Green** purchasing agent of **Boyd-Wagner Co.**, Chicago.

OBITUARIES...

Morton E. Thierwechter, 66, president, **Ayling & Reichert Co.**, Toledo, O., for 29 years, died Mar. 24.

William J. Heatley, 66, president of **Federal Malleable Co.**, Milwaukee, and vice president, **Starline Inc.**, Harvard, Ill., died Mar. 19.

Elmer H. Wegner was appointed vice president - manufacturing, **Cleaver-Brooks Co.**, Milwaukee. Formerly director of purchasing with **Ladish Co.**, he joined Cleaver-Brooks in 1953 in the same capacity, later becoming general manager of manufacturing.

S. L. Weaver was made Buffalo district manager of **Latrobe Steel Co.**

W. P. Perkins was made Philadelphia district sales manager for **American Chain Division**, American Chain & Cable Co.

Ira W. Fine was made Philadelphia area sales manager for **Enamel-strip Corp.**, Allentown, Pa.

George L. Palmer, former vice president and treasurer of **Willys Motors Inc.**, was made vice president and controller of **Schemenauer Mfg. Co.**, Holland, O.

Roland S. Withers succeeds the late **Walter N. Potter** as general manager, **United Motors Service Division**, General Motors Corp., Detroit.

Carl J. Sitarz, 62, retired vice president, **Chicago Steel Tank Co.**, Chicago, died Mar. 23.

J. Merle Finney, chairman of **United Steel Barrel Co.**, Cleveland, died Mar. 28.

Fred F. Harroff, 58, former general manager, lamp division, **General**

Gordon Kiddoo was elected vice president - development, **National Research Corp.**, Cambridge, Mass. He was director of the development department.

William R. Graves was made manager, electronic data processing machines, special sales department, **International Business Machines Corp.**, New York.

Allan L. Burton was made research director of **Veeder-Root Inc.**, Hartford, Conn.

Robert W. Negus heads the newly established custom products department of **Arnold O. Beckman Inc.**, South Pasadena, Calif.

William A. McGill is the new manager of the work order department at the Pittsburgh steel service plant of **Joseph T. Ryerson & Son Inc.**

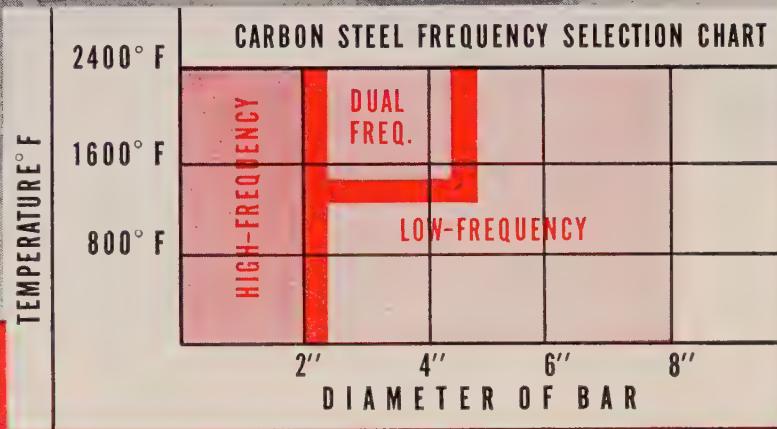
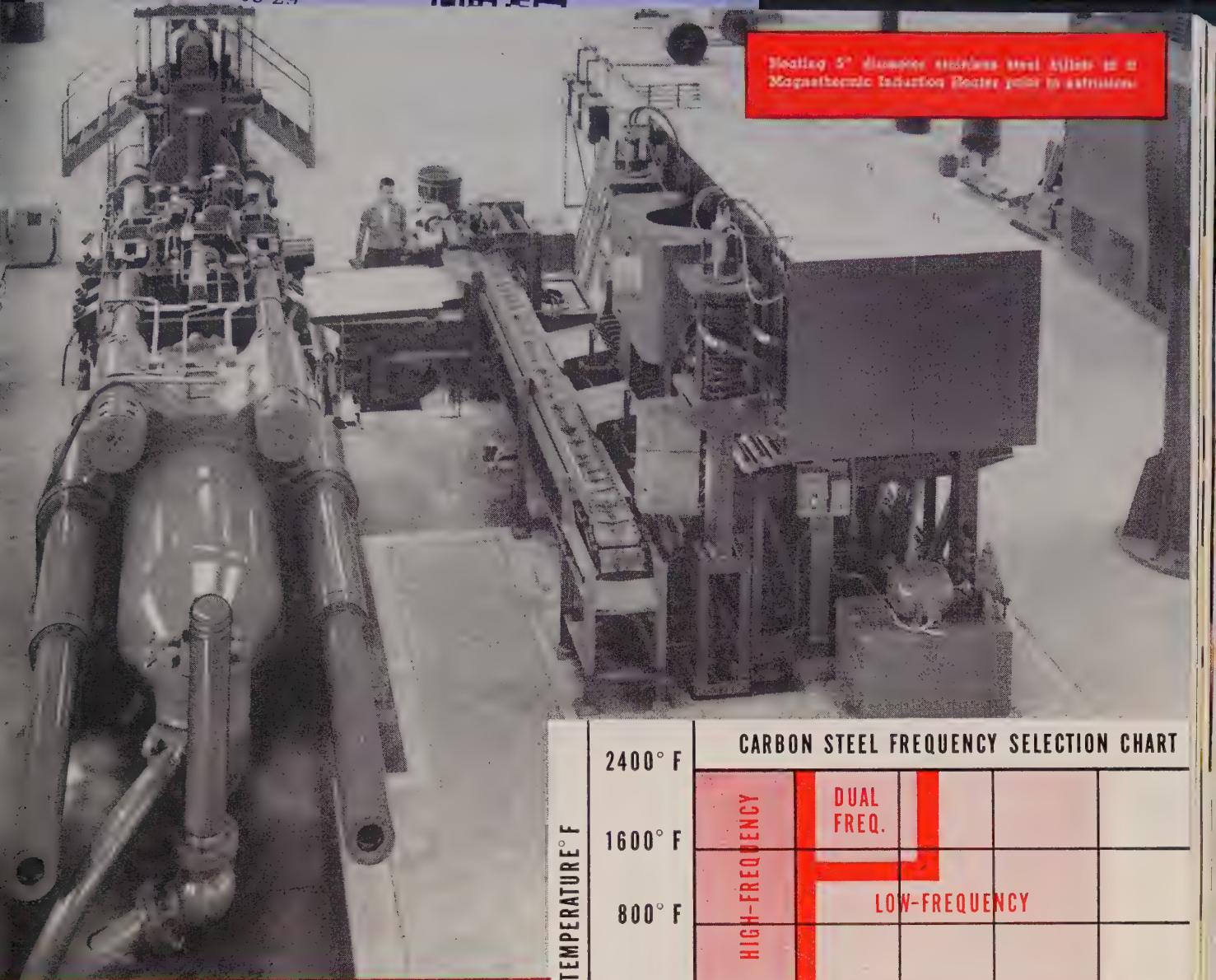
H. Melvin Carnahan was made assistant sales manager in charge of residential air conditioning for the **Airtemp Division**, **Chrysler Corp.**, Dayton, O.

Electric Co., at Nela Park, Cleveland, died Mar. 27.

William N. Boutin, 63, a sales representative for **Continental Roll & Steel Co.**, East Chicago, Ind., for 15 years died Mar. 10.

S. G. Dunning, 63, service consultant, **Reliance Electric & Engineering Co.**, Cleveland, died Mar. 16.

Heating 5" diameter stainless steel billet in a
Magnethermic Induction Heater prior to extrusion.



FORGE WITH INDUCTION HEATING

AND DO A BETTER JOB

With induction heat, a 5" diameter steel billet reaches forging temperature in less than five minutes. This rapid heating cuts operating costs by minimizing scale loss, maintenance costs, manpower and floor space. The equipment can be fitted into an automatic processing line, making billet pre-heating just one minor step in a forging operation. This is why modern production forging and extrusion plants are buying induction heating equipment.

Regardless of size of work or frequency, Magnethermic builds the equipment to meet your need. This company specializes in Induc-

tion Heating equipment, low-frequency or high-frequency, through 10,000 cycles. Write to Magnethermic for bulletin or information about your specific questions.

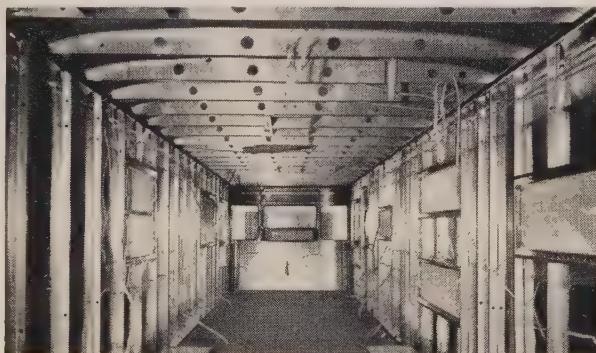


60 THROUGH 10,000 CYCLES

AT NEMCO FOUNDRY: ANOTHER PROBLEM SOLVED BY CITIES SERVICE CORE OIL

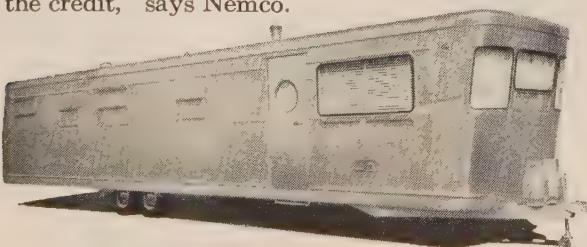


The die pictured here was cast at Nemco Foundry for use by the Spartan Aircraft Company in producing roof ribs for its Spartan Mobile Home. Difficult to produce, it required 10 cores $2\frac{5}{8}$ " x $2\frac{5}{8}$ " square and 25 cores, quarter-circle in shape, from $\frac{3}{4}$ " to 1" in diameter. Semi-circular shape was necessary to core curved slots from top of die to sides. Holes had to be clean and free from obstruction, allowing stamped slugs to fall through. Nemco relied on Cities Service Delco Core Oil to help meet exact specifications. "A smart choice," says J. A. Dean, General Manager. "Delco Core Oil made the job far easier."



THE ROOF RIBS

The roof ribs of this Spartan trailer, cast from the die produced at Nemco, are visual proof of a job well done. "The great strength and high collapsibility of Cities Service Delco Core Oil share a lot of the credit," says Nemco.



THE FINISHED PRODUCT

The finished product is this handsome Spartan Mobile Home awaiting shipment to consumer. Spartan's rigid specifications help make it one of the safest and best on the market.

Difficult casting of die to form roof ribs for Spartan Mobile Home made easier by Cities Service Delco #36

Located in Tulsa, Oklahoma, Nemco Foundry enjoys attacking the really tough jobs and making them easier. And often helping to spearhead the attack is Cities Service, as described here by J. A. Dean, General Manager:

"Recently Cities Service Delco #36 Core Oil again solved a tough job for us in fulfilling the requirements for a casting for the Spartan Aircraft Company, makers of Spartan Mobile Homes. The casting was a bottom shoe for blanking die to make roof ribs for the all-aluminum shells for Spartan trailers.

"The die was of Nemcoloy, Type AL, an alloyed grey iron. It was 106" long, 8" thick and $13\frac{1}{2}$ " wide and weighed 2,018 lbs. cleaned.

"It required 10 cores $2\frac{5}{8}$ " x $2\frac{5}{8}$ " square. In addition it demanded 25 cores, quarter-circle in shape, ranging from $\frac{3}{4}$ " to 1" in diameter. Semi-circular design was necessary in order to core curved slots from the top of the die to the sides of the die. Holes had to be clean and free of obstructions allowing the stamped slugs to fall through the die to the outside and not hang up.

"Cities Service Delco #36 Core Oil enabled us to meet these requirements perfectly. We certainly recommend it where great strength and high collapsibility are needed."

Like Nemco, scores of other foundries have reported unusual results with problem-solving Cities Service Core Oils. Nor does the praise end with the product... for time and again the solution for the proper core oil has resulted from the knowledge, understanding and experience of a Cities Service Lubrication Engineer. If you have a lubrication problem, why not talk it over with one of these Cities Service experts? Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES **SERVICE**
QUALITY PETROLEUM PRODUCTS

New Plant for Blaw-Knox

Facilities at Mattoon, Ill., to replace plants in New York, Ohio and Pennsylvania

BLAW-KNOX CO., Pittsburgh, this month starts construction of a multimillion dollar plant at Mattoon, Ill. Completion of the plant, which will manufacture road building equipment, is set for late 1955. First production is scheduled for March, 1956.

The Mattoon plant will have 200,000 sq ft of manufacturing space, a 35,000-sq-ft building to provide space for parts and services and a 16,000-sq-ft office building.

Manufacturing operations of three plants—at Nunda, N. Y., Elyria, O., and Blawnox, Pa.—will be consolidated in the Mattoon plant. Its production capacity will be one-third larger than present facilities.

Douglas Makes More Missiles

Douglas Aircraft Co., Santa Monica, Calif., established a new division at Charlotte, N. C., for expanded production of guided missiles. Production is expected to start early in 1956 in a 1,250,000-sq-ft plant.

G. M. To Spend \$75 Million

General Motors Corp., Detroit, will spend \$75 million on facilities and development work at its Allison Division, Indianapolis. The program includes new engineering, research and testing facilities, which are designed to assist in the development of new high performance turboprop and turbojet aircraft engines for military and commercial uses.

Republic Builds Coke Ovens

Construction of a battery of 31 by-product coke ovens will start this summer at Republic Steel Corp.'s steel plant at Massillon, O. They will be built on the foundation for the present battery of 49 ovens, which will be torn down. Their last production will be about May 10. The new battery, which will increase capacity to over 180,-

(Please turn to page 96)

The advertisement features several images of Laclede-Christy refractory products. At the top right is a large rectangular block labeled "Laclede-Christy Super Plastic Fire Brick for industrial furnaces". Below it is a smaller rectangular block labeled "Laclede-Christy cupola block; and kiln liners for cement and lime industry". In the center is a large, curved archway made of refractory brick. To the left is a long, rectangular block labeled "LACLADE SPALLAC". To the right is a rectangular block with a circular stamp reading "CAST 400" and "12x24x36". Text on the stamp also includes "PATENT APPLIED FOR" and "LACLADE-CHRISTY COMPANY". A small inset image shows a person working in a kiln or furnace.

Name your refractory needs

What do you want? Not just the correct refractory for your purpose, but fire brick, blocks or liners that deliver more than you expect. You want benefits that go with this kind of service—minimum furnace down time, long furnace life and economical output. You also may want engineering service and follow-through for on-schedule performance.

You fill them best here

Laclede-Christy refractories—for the purpose you name—meet your most rigid requirements. "Quality first" is supported by many, many record performances. Laclede-Christy service is quick and helpful. The extra engineering help you may need is here too—at

LACLEDE-CHRISTY COMPANY



DIVISION OF H. K. PORTER COMPANY, INC.

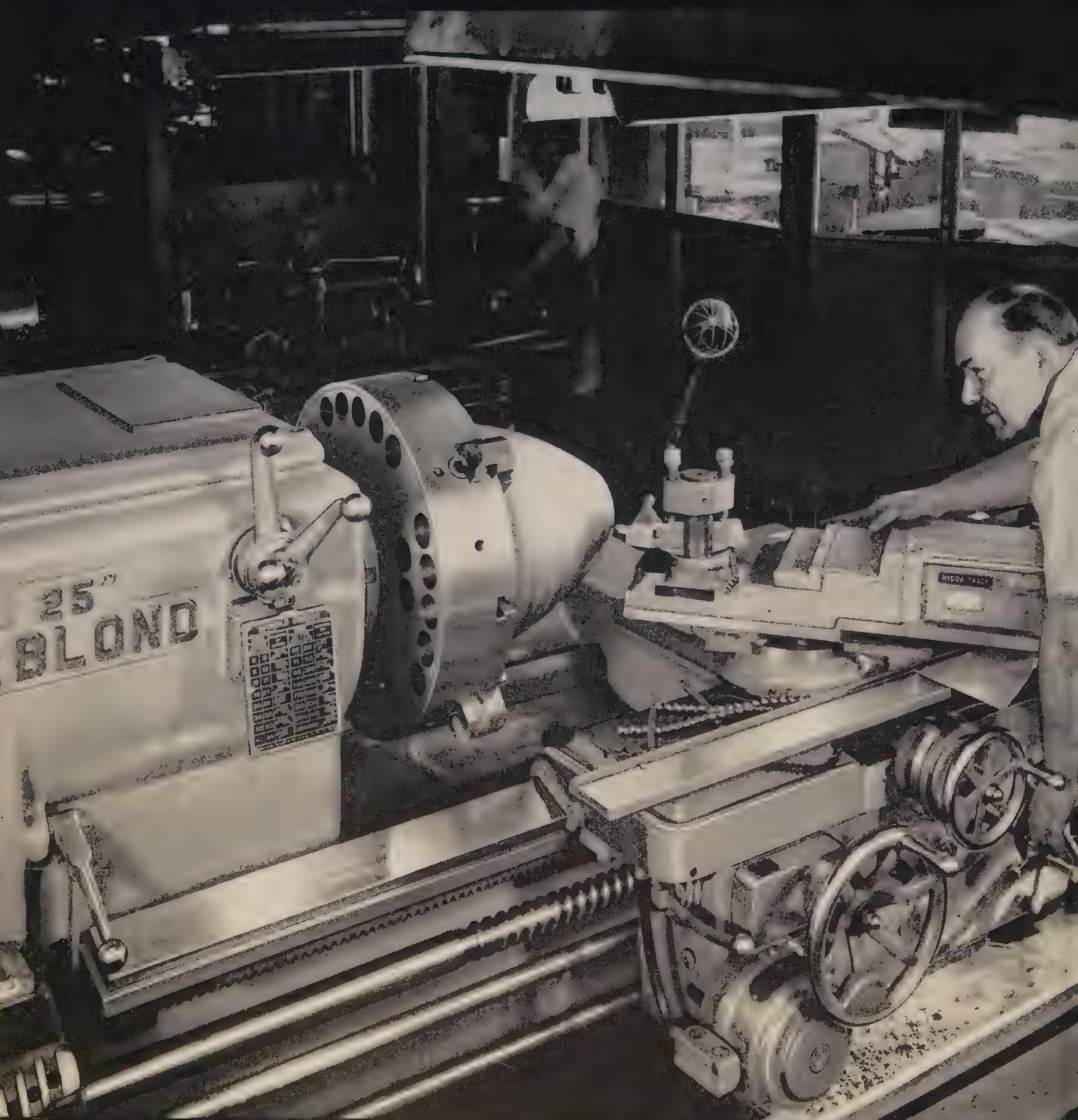
2000 Hampton Avenue • St. Louis 10, Missouri
Mission 7-2400



Inaugurating a new era of service to the industrial heating industry

At United Specialties Co. . . .

Here's Diversified Toolroom Turning



Turning Spin Blocks (dies) for TV Cones
United uses 24" tool steel blocks to spin their metal TV cones. Large swing capacity in their LeBlond Toolroom lathe allows them to handle these die-turning jobs promptly as they are needed. They get high speed excellent finish and accurate contours.

from 1000 lb. Spin Blocks

to Contoured Stamping Dies

Accomplished with smooth-powered LeBlond 25" Tracing Lathe

Toolroom jobs at United Specialties Co., Chicago, required a big-swing lathe for pieces like heavy spin-blocks, plus convenience and ease of handling on smaller die jobs—many with difficult contours.

Sales engineers at our Chicago Office recommended a LeBlond 25" Heavy-Duty Lathe with Hydra-Trace. It gave United just what they needed—big-swing, smooth power, a lathe that could tackle virtually any of their die-turning jobs.

Mr. M. J. Perkovich, Toolroom Superintendent for United Specialties, says "Our LeBlond Lathe with Hydra-Trace works at least 75% to 175% faster than previous methods. And it completely removes all 'guesswork' on the part of our operators when shapes and radii are involved."

In the toolroom or on the production line, you can count on LeBlond Heavy-Duties with Hydra-Trace to have plenty of "beef" for heavy hogging, plenty of accuracy for extra-fine finish. And they're ideal for complex contour and angle work. Hydra-Trace attachment is easily and quickly installed or removed. Gives maximum flexibility of adjustment for best working angle.

LeBlond Heavy-Duty features include: 4-direction power rapid traverse built into apron; one-piece double-wall apron, hardened rack; totally-enclosed quick-change box; hardened and ground replaceable steel bed ways; thrust lock tailstock. See your LeBlond Distributor today or write for bulletin HD 155T-G.

Hydra-Trace (Trade Mark, Registered U. S. Pat. Office) is LeBlond's heavy-duty hydraulic tracing attachment. Can be mounted in place of the compound rest on practically all LeBlond Lathes.



Turning mating dies for stamped air-cleaner parts—United stamps out complicated ridged and contoured air-cleaner parts, in many sizes and shapes. In each case, mating "re-draw and size" dies are needed. Die shown above, for instance, has 11" O. D. with complex contours and angles, calling for tool "dive-in" on some surfaces. As a result, top cutting speeds cannot be used. United happily found that their LeBlond 25" gives them all the power they need, even at low rpm—with no stalling, no shakes and jitters, no ruined dies or frayed tempers.

LEBLOND
of Cincinnati

.... cut with confidence

THE R. K. LEBLOND MACHINE TOOL COMPANY, CINCINNATI 8, OHIO
WORLD'S LARGEST BUILDER OF A COMPLETE LINE OF LATHES • FOR MORE THAN 67 YEARS.

(Concluded from page 93)

000 tons a year, is expected to be in production about Dec. 1.

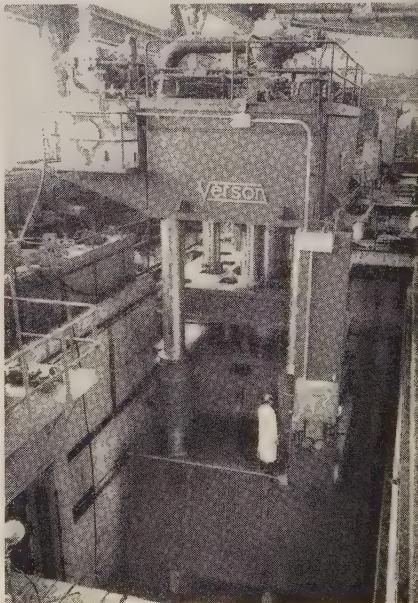
Relining of the Massillon blast furnace, which has a daily capacity of 680 tons of iron, will take place during the construction of the coke battery. Relining is expected to take two months.

During the construction period, coke for the blast furnace will be supplied from stocks and other Republic plants in Ohio. Similar arrangements have been made for supplying Massillon's nine open-hearth furnaces with iron while the blast furnace is out of operation.

Westinghouse Adds to Plant

Westinghouse Electric Corp., Pittsburgh, will spend over \$1 million to modernize facilities for the production of soft drink bottle dispensers, dehumidifiers and water coolers at its Electric Appliance Division plant, East Springfield, Mass.

The new allocation makes a total of \$8.7 million to be spent on the East Springfield plant. About \$4.3 million is being spent to mod-



One Stroke Is Enough

One stroke of this huge press exerts 6 million lb of pressure to form heads for pressure vessels as large as 10 ft in diameter and 3 ft deep. It was built by the Verson Allsteel Press Co., Chicago, for the Colorado Fuel & Iron Co., Denver, which will use it to form both hemispherical and elliptical heads from heavy steel plate.

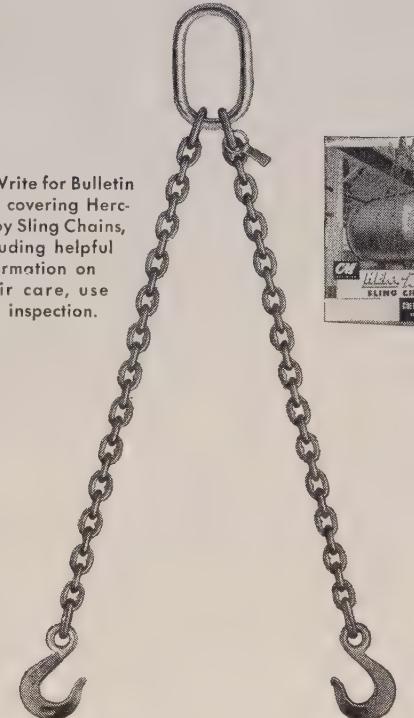
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SLING CHAINS

● Herc-Alloy is the only exact-size alloy chain on the market. This uniformity gives you a lighter and easier-to-handle chain without any sacrifice in working load limit.

● Herc-Alloy, the original alloy steel chain, is available in running lengths as well as in all types and sizes of slings made to customer specifications.

● Write for Bulletin 100 covering Herc-Alloy Sling Chains, including helpful information on their care, use and inspection.



● CM also produces a complete line of chain attachments and welded chain of all types including stainless steel and bronze.



CM
HOISTS AND CHAIN

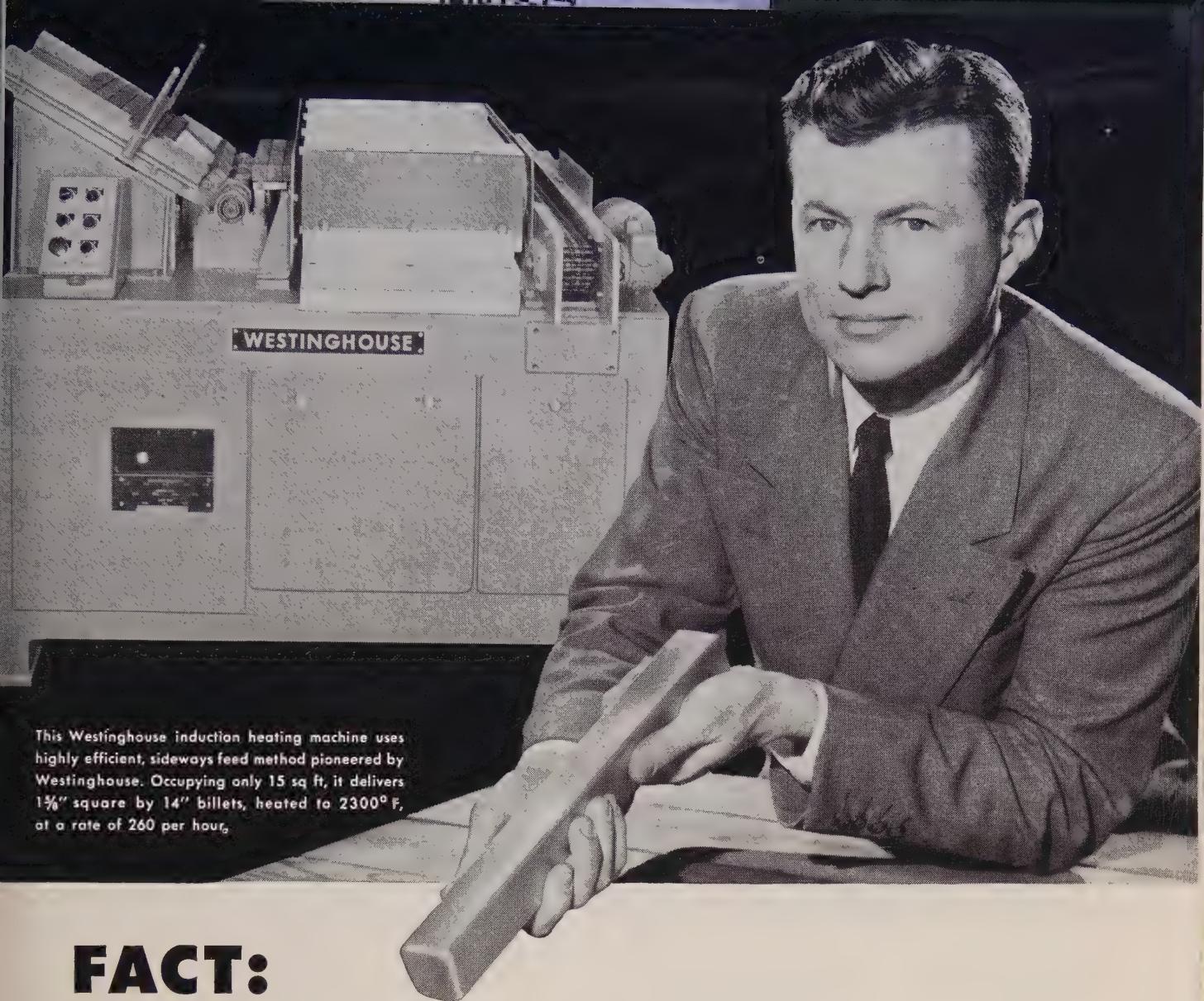
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In Canada: MCKINNON COLUMBUS CHAIN LTD.,
Herc-Alloy® ST. CATHARINES, ONT.



This Westinghouse induction heating machine uses highly efficient, sideways feed method pioneered by Westinghouse. Occupying only 15 sq ft, it delivers 1½" square by 14" billets, heated to 2300° F, at a rate of 260 per hour.

FACT:

This completely automatic billet heater cuts forging costs . . . ups production

These specific advantages tell why:

Scale Loss—0.6% is typical—60 to 80% less than other heating methods, because the speed and precision of Westinghouse induction heating doesn't give scale a chance to form.

Maintenance Costs—80% reduction is not at all unusual, because Westinghouse design gives you high availability—minimizes maintenance labor costs.

Down-Time Production Loss—Extremely low down time of Westinghouse induction heating equipment compared with other heating methods means less lost production.

Labor Costs—50% savings are not at all unusual, because Westinghouse automatic equipment eliminates handling operations.

Other Advantages, including significant space savings; cool, clean working conditions; quick start-up and very low stand-by losses, combine to make Westinghouse induction heating your best investment in advanced, lowest cost billet heating. For sound advice on reducing *your* forging costs, call The Man With The Facts—your Westinghouse sales engineer. And—ask him for your copy of booklet B-6519, or write Westinghouse Electric Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

J-02295

YOU CAN BE SURE...IF IT'S

Westinghouse





NOW! THESE NEW BULLETINS

TELL ALL ABOUT BRIDGEPORT GRINDING AND ABRASIVE CUT-OFF MACHINES

With their recent acquisition of the Bridgeport Line, LOBDELL UNITED DIVISION, United Engineering and Foundry Company, announces the publication of these two new bulletins. One covers the Bridgeport Line of Grinding Machinery and the other explains the Bridgeport Line of "ABRASAW" Abrasive Cut-Off Machines.

In the Grinding Machinery bulletin, illustrations, specifications and features are well brought out on the complete range of sizes of Face and Knife Grinders, Vertical Spindle Surface Grinders, Traveling Head Knife Grinders and Floor Grinders.

Similar information is equally as well illuminated in the "ABRASAW" Cut-Off Machine Bulletin—also, some interesting performance data and photographic examples.

Write for copies of these bulletins to:

LOBDELL UNITED DIVISION

1836 WILMINGTON 99, DELAWARE 1955

UNITED ENGINEERING AND FOUNDRY COMPANY

ernize facilities to produce electric fans, food mixers and vacuum cleaners. An additional \$3.2 million is being invested in new tooling for room air conditioners. Twice the volume of consumer goods can be produced when the expansion and improvement are complete.

Timken Builds in Canada

Timken Roller Bearing Co., Canton, O., will construct a rock bit producing facility at its St. Thomas, Ont., plant. The new building will contain 5600 sq ft of floor space. It and equipment will cost an estimated \$250,000.

Carbide insert rock bits will be produced for expanding Canadian markets and export at the St. Thomas plant in sizes up to 3 in. in diameter. First production is expected about September, 1955.

Kaiser Buys Dolomite Property

Kaiser Aluminum & Chemical Corp., Oakland, Calif., purchased 353 acres of dolomite property adjoining its Chemicals Division plant site at Natividad, Monterey county, Calif. Calcined dolomite is shipped from the Natividad plant to the corporation's plant at Moss Landing, Calif., for processing into magnesia. The magnesia, in turn, is further processed at the Moss Landing refractory plant into high-temperature refractory brick.

Steel Firm Opens Sales Office

Columbia Steel & Shafting Co., Pittsburgh, opened a New York metropolitan sales office at 1809 Springfield Ave., Maplewood, N. J. District manager of sales is T. A. Harper.

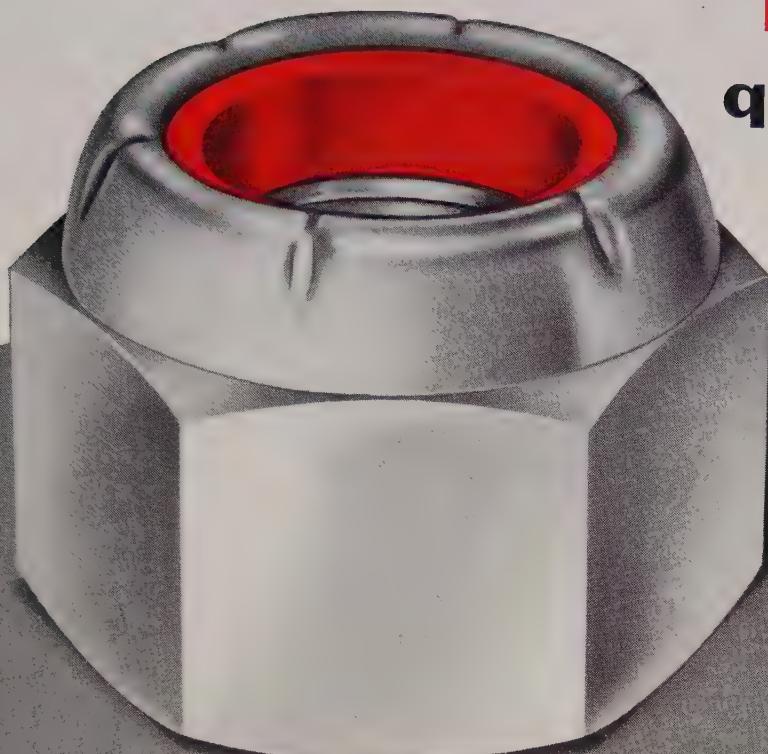
Foundry Stops Machining

Dayton - Portsmouth Foundry Co., Portsmouth, O., a subsidiary of Dayton Steel Foundry Co., has ceased part of its machine shop operations for economic reasons.

Thompson Adds Two Plants

Thompson Products Inc., Cleveland, is spending \$9 million for two new manufacturing plants. Construction of a new chassis

What size is a quality fastener?



Here are two ELASTIC STOP® nuts.

Each has the familiar red locking collar. Each is self-locking, vibration-proof and can be reused many times. Each is a fast, readily assembled one-piece unit . . . will maintain accurate adjustment anywhere on a bolt.

Each will afford positive protection against thread corrosion . . . prevent liquid seepage along bolts. Each is manufactured in quantity. Each is exactly controlled as to quality of raw material, finished dimensions, class of thread fit, seat squareness and finish. Each has a record for precision and uniformly high performance that is unmatched.

But . . . one measures 1/10 inch across the flats; the other, 4 inches. Between these two, there are more than 530 different hex nuts in the ESNA line. They are the result of variations in height, material, finish and size.

Look to ESNA for the top quality self-locking fastener that fits your need best.

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Elastic Stop Nut Corporation of America
Dept. N58-460, 2330 Vauxhall Road, Union, N. J.
Please send the following free fastening information:

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Here is a drawing of our product.
What self-locking fastener would
you suggest?

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a difficult piece to HARDEN ...

... yet it gave no trouble

thanks to

SAGAMORE

DIE STEEL

Note the complex section of this small ratchet driven friction clutch. Yet, with non-deforming Sagamore Die Steel, there is no distortion or size variation in the intricate webbing.

After being machined from a 3" round bar of Ludlum Sagamore, the clutch was hardened from 1775 F. The piece was air cooled and then drawn at 600 F. The result, a Rockwell C hardness of 55/56.

Ludlum Sagamore is a relatively new type of non-deforming die steel which has had a rapid increase in popularity. It combines excellent non-deforming properties and unusual toughness with freedom from hardening hazards. Similar to high carbon-high chromium steels in behavior and applications, Sagamore has the added advantages of lower hardening temperatures, easier machining and grinding, greater toughness and lower costs.

There's an A-L tool steel to help solve your toughest tool steel problems. Call your nearest office or distributor today, or write *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pennsylvania.*



Write for your
SAGAMORE BLUE SHEET

A concise 4-page booklet of facts on the handling and shop treatments of Sagamore. Included is complete information on forging, annealing, tempering, etc. and detailed laboratory data on physical characteristics. Ask for your free copy.

Address Dept. S-641

For complete MODERN Tooling, call
Allegheny Ludlum

W&D 5349



parts building will begin this year in Detroit. Costing \$6 million, the plant will have a floor area of about 390,000 sq ft. Completion is expected by the summer of 1956. In Cleveland, Thompson bought a 370,000-sq-ft building from the White Motor Co., Cleveland. Purchase price was \$3 million.

Amerigear-Zurn Formed

Amerigear-Zurn Inc., Erie, Pa., has been formed as the national sales organization for flexible couplings and allied power transmission products made by American Flexible Coupling Co., Erie. Both companies are affiliates of J. A. Zurn Mfg. Co., Erie.

Plomb Tool Buys Firm

Plomb Tool Co. purchased Industrial Tools Mfg. Co. and formed an operating subsidiary, Industrial Tools Mfg. Corp., all of Los Angeles. H. D. Norton is president of the subsidiary.

Univertical Gets Furnaces

Univertical Foundry & Machine Co., Detroit, installed five, 1-ton-capacity, rocking electric furnaces for casting nickel anodes. Potential capacity of the furnaces is 7500 lb an hour.

Olympic Increases Facilities

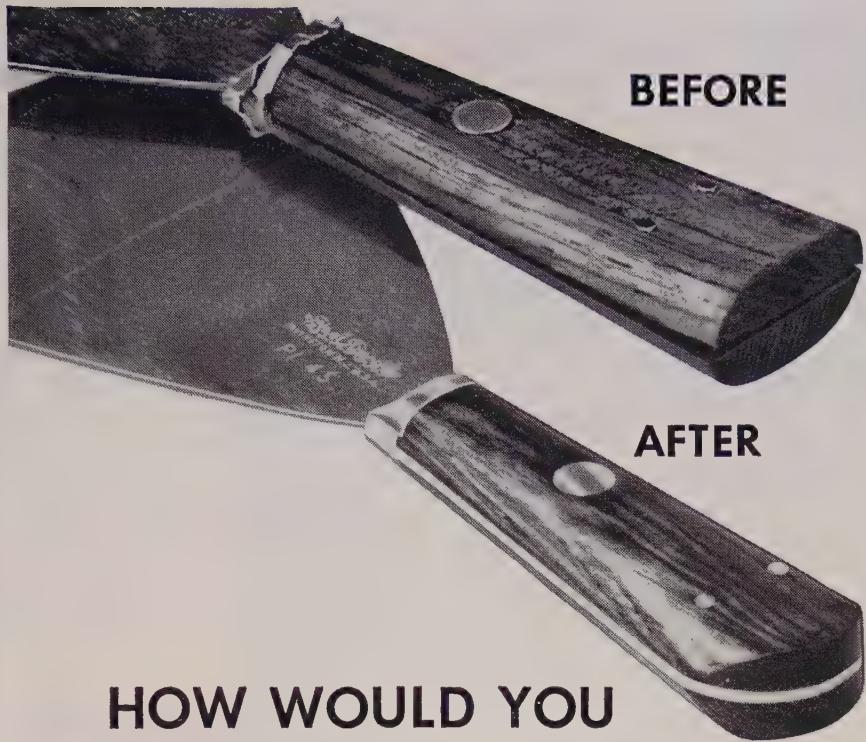
Olympic Metal Products Co. Inc., Alpha, N. J., completed a 100 per cent expansion of facilities for the production of deep drawn metal housings.

Rampe Consolidates Plants

Rampe Mfg. Co., Cleveland, consolidated its two plants in a factory which has increased floor space. Rampe manufactures tumbling and burring machines.

Thor Corp. Closes Plant

Thor Corp., Chicago, will close and sell its main manufacturing plant in Cicero, Ill. A new type of automatic washer is to be made for Thor in Avco Mfg. Corp.'s plant at Nashville, Tenn. Production (Please turn to page 104)



HOW WOULD YOU SOLVE IT?

1 PRODUCTION PROBLEM. Using several set-up wheels to grind and finish putty knife handles proved to be a slow and costly method for Pioneer Tool division of "Red Devil" Tools at Bloomfield, New Jersey. Each set-up wheel lasted only one hour before it had to be recoated. To solve this problem, a 3M Representative made the following recommendation:



2 SOLUTION. He suggested that the manufacturer switch to the 3M Method using Three-M-ite Resin Bond Cloth Belts. This allowed operators to grind flash off white metal bolsters, finish brass rivets, shape and blend cocobolo wood handles and steel tangs to size—in just one operation!



3 RESULTS. An immediate increase in production with each belt finishing 1,900 handles. Smoother, more uniform finishes at lower unit costs. A 3M Representative can help you solve your grinding and finishing problems, too. His services are available without cost or obligation. Call him today.

Want more information?



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- Please have 3M Representative call

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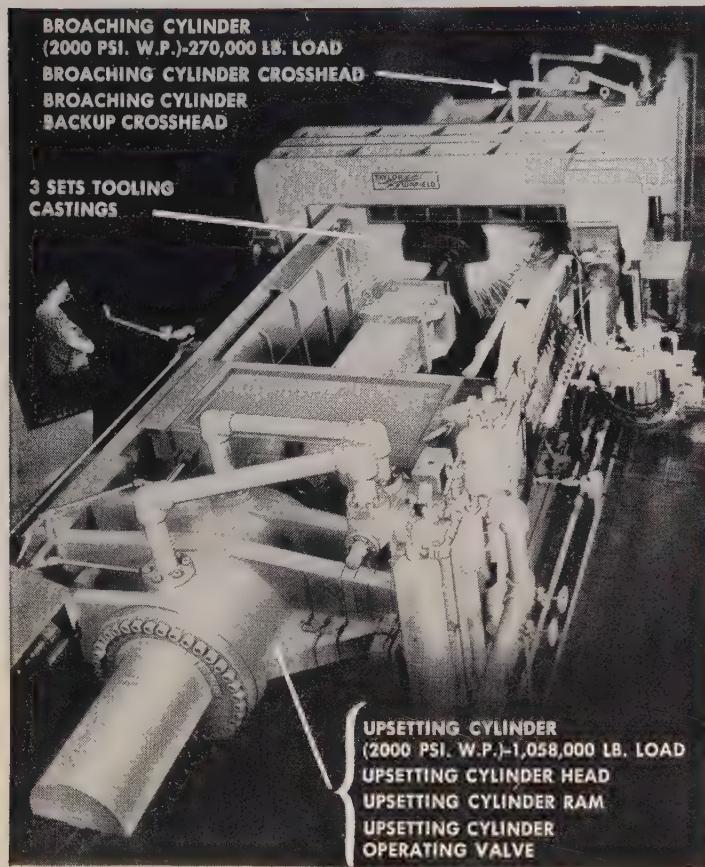
CITY..... ZONE... STATE.....

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The MEEHANITE® Casting Report



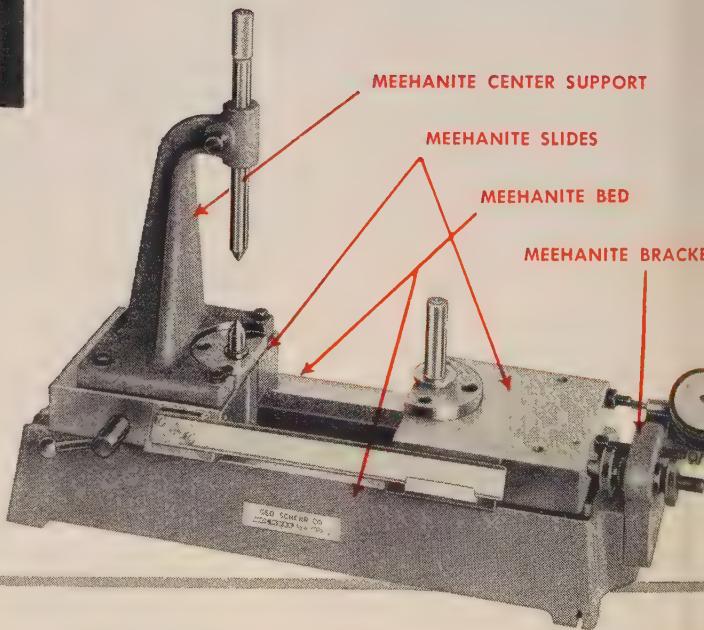
20 TONS OF MEEHANITE CASTINGS IN THIS 500-TON RESISTANCE WELDER

The Taylor-Winfield Corporation, Warren, engineered and built a 500-ton resistance welder (largest of its kind in the world), for the Cleveland Pneumatic Tool Company. It has an upsetting load of 1,058,000 pounds and a broaching load of 270,000 pounds.

Taylor-Winfield engineers chose Meehanite castings as the heart of this huge welder because of their high strength, their pressure tightness, and their wearing properties. The illustration shows the Meehanite parts.

As The Manufacturer Says:

"Due to Meehanite Metal's close or fine grain size, the machining qualities are excellent. This gives us better finish and greater strength. Meehanite's heat-treatability gives us longer life for our press welders."



PRECISION INSTRUMENT MANUFACTURER SPECIFIES MEEHANITE CASTINGS

The George Scherr Co., Inc., New York City, manufacturers of precision measuring and testing instruments, has found that insisting upon Meehanite components in the building of their spur gear tester has resulted in greater economy and in the elimination of assembly and fitting problems.

As The Manufacturer Says:

"The production of this testing machine was engineered completely by the use of Meehanite castings. We needed hardened and ground ways in the bed and, similarly, in both slides. If we had provided these by using hardened and ground steel inserts, it would have made the production of the machine

much more expensive.

"Instead, we flame-harden both the ways in the bed and the ways at the bottom of the two slides. As a result, we have no extra assembly or fitting problems, and the finishing of all the guide ways is a simple surface grinding operation."

Industries report what Meehanite Castings have done for them

MEEHANITE COMPONENTS

IN HYDRAULIC UNIT SEAL ASSEMBLY

The Twin Disc Clutch Company, Hydraulic Division, Rockford, Illinois, is using Meehanite components to improve performance and reduce maintenance.

The seal nose pieces (Fig. 1) for the Fluid Drive Seals are heat treated after machining. They are brought to a heat of 1580-1610 F to 8 hours and packed in fine carburizing compound to prevent decarburization. They are then quenched in oil and drawn at 400-425 F for 4 hours.

It is necessary that the seal surface be ground and lapped flat within wave bands of green-yellow light (.000069") and have maximum profilometer reading of 12 micro-inches.

Fig. 2 shows the seal test stand in operation. On the stand are two Torque Converter Seals using Meehanite castings, the oldest having been run for 7,724 hours at 50 psi and 2,500 rpm.

As The Manufacturer Says:

Meehanite metal, noted for its high tensile strength, provides many advantages for its use as seals for Twin Disc Hydraulic Torque Converters and Fluid Couplings.

"It has proved to have excellent wear properties and provides very uniform hardness in the heat treating process."



Fig. 1

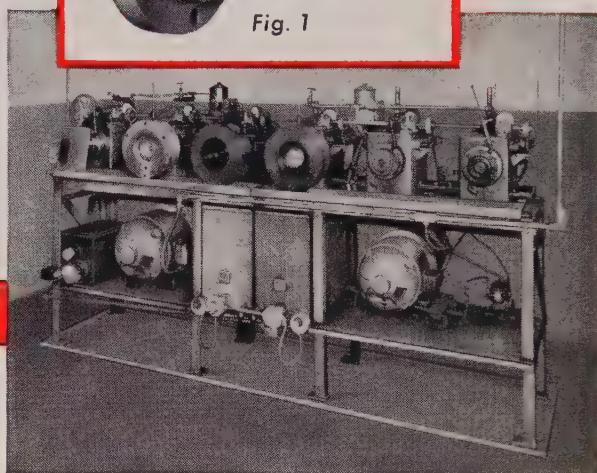


Fig. 2

ONLY A MEEHANITE FOUNDRY CAN MAKE MEEHANITE CASTINGS

The American Laundry Machinery Co. Rochester, New York
Atlas Foundry Co. Detroit, Michigan
Banner Iron Works St. Louis, Missouri
Barnett Foundry & Machine Co. . . Irvington and Dover, New Jersey
E. W. Bliss Co. Hastings, Mich. and Toledo, O.
Compton Foundry Compton, Calif.
Continental Gin Co. Birmingham, Alabama
The Cooper-Bessemer Corp. . Mt. Vernon, Ohio & Grove City, Pa.
Crawford & Doherty Foundry Co. Portland, Oregon
DeLaval Steam Turbine Co. Trenton, New Jersey
Empire Pattern & Foundry Co. Tulsa, Oklahoma
Farrel-Birmingham Co., Inc. Ansonia, Connecticut
Florence Pipe Foundry & Machine Co. . . . Florence, New Jersey
Fulton Foundry & Machine Co., Inc. . . . Cleveland, Ohio
General Foundry & Manufacturing Co. . . . Flint, Michigan
Georgia Iron Works Co. Augusta, Ga.
Greenlee Foundry Co. Chicago, Illinois
The Hamilton Foundry & Machine Co. Hamilton, Ohio
Hardinge Company, Inc. New York, New York
Hardinge Manufacturing Co. York, Pennsylvania
Johnstone Foundries, Inc. Grove City, Pennsylvania

Koehring Co. Milwaukee, Wisconsin
Lincoln Foundry Corp. Los Angeles, California
Palmyra Foundry Co., Inc. Palmyra, New Jersey
The Henry Perkins Co. Bridgewater, Massachusetts
Pohlman Foundry Co., Inc. Buffalo, New York
Rosedale Foundry & Machine Co. Pittsburgh, Pennsylvania
Ross-Meehan Foundries Chattanooga, Tennessee
Shenango-Penn Mold Co. Dover, Ohio
Sonith Industries, Inc. Indianapolis, Ind.
Standard Foundry Co. Worcester, Massachusetts
The Stearns-Roger Manufacturing Co. . . . Denver, Colorado
Traylor Engineering & Mfg. Co. . . . Allentown, Pennsylvania
Valley Iron Works, Inc. St. Paul, Minnesota
Vulcan Foundry Company Oakland, California
Washington Iron Works Seattle, Washington

Hartley Foundry Division—**CANADA**

London Concrete Machinery Co., Ltd. . . . Brantford, Ontario
E. Long Ltd. Orillia, Ontario
Otis Elevator Co., Ltd. Hamilton, Ontario

Write for your copy of "The Handbook of Meehanite Metals"

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Harrison 7-2179

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REctor 2-1888

CENTRAL OFFICE
North Tonawanda
JACKSON 2400 (Buffalo)

(Concluded from page 101)

tion of wringer washers will be continued at Thor's Bloomington, Ill., plant.



NEW ADDRESSES

Midwest Precision Castings Co., maker of castings by the lost-wax process, moved to improved facilities at 10703-09 Quincy Ave., Cleveland 6, O.

Electric Controller & Mfg. Co., moved to 4500 Lee Rd., Cleveland 28, O.

Baker Steel & Tube Co., Los Angeles, moved to larger quarters at 1540 Calzona St.

Atlas Powder Co., Wilmington, Del., transferred sales headquarters for its Darco activated carbons to Wilmington.

Assembly Products Inc., manufacturer of electronic equipment, moved to Chesterland, O.

Copper & Brass Warehouse Association Inc., moved its offices to suite 1025, Investment Bldg., 15th and K St. N. W., Washington, D.C.



REPRESENTATIVES

Detroit Electric Furnace Division, Kuhlman Electric Co., Bay City, Mich., expanded its sales division. Brumley-Donaldson Co., Los Angeles, and Oakland, Calif., was appointed sales representative for northern California. The company has been Detroit's representative in southern California for over a year.

C. W. Lueders Jr., Riverton, N.J., was appointed sales agent for eastern Pennsylvania, southern New Jersey and Maryland.

Galion Allsteel Body Co., Galion, O., appointed C & M Equipment Co., Minneapolis, its Minnesota distributor of dump bodies and hydraulic hoists.

American MonoRail Co., Cleveland, appointed the following distributors: Newell Equipment Co., Birmingham; Ken-Dick Corp., Moline, Ill.; Miller Steel & Supply Co.

STEEL PRODUCERS' EARNINGS AFTER TAXES

MILLIONS OF DOLLARS



30th ANNUAL
FINANCIAL
ANALYSIS
OF THE
STEEL INDUSTRY

Supplement to

STEEL

April 11, 1955

Production Pace Down, Profit Rate Up

FEWER SALES DOLLARS were taken in by the steel industry in 1954 than in 1953, but it was able to keep a larger percentage of them. Sales dropped 18.9 per cent, but net earnings were 6.02 cents in every sales dollar, compared with 5.61 cents in 1953.

Reasons for the bigger "take" were threefold: 1. Reduced rate of operations, which contributed to efficiency. 2. Absence of federal excess profits tax in 1954. 3. Reduced costs of some raw materials.

Net earnings per sales dollar have been on the upswing the last two years. To find a figure better than 1954's, you must go back to 1950 when earnings stood at 7.99 cents.

Softens the Drop

Without the help of the steel price increase at midyear, the decline in the dollar volume of sales would have been larger than 18.9 per cent. At that, the slide was not as much percentagewise as that of ingot production. It dropped 20.8 per cent below the 1953 level.

Seven years had greater steel output than 1954, but only three had a larger net income, which was 13 per cent under that of 1953. The 33 companies in STEEL's 30th Annual Financial Analysis of the Steel Industry had total net earnings of \$605,625,835 in 1954, compared with \$696,393,472 in 1953. The 33 companies represent 94.1 per cent of the nation's ingot ca-

pacity. Not all of them report a shrinkage in net income. Eight enjoyed gains over 1953. Of the 25 companies with earning positions poorer in 1954 than in 1953, three suffered net deficits in 1954.

Because of the rise in earnings per sales dollar, the net income per ton of ingots produced climbed from \$6.42 in 1953 to \$7.24 in 1954—highest since 1950's \$8. Net income per ton of ingot capacity went down from \$6.12 in 1953 to \$5.20 in 1954 because of the substantial increase in capacity and the decrease in total net income.

Taxes Slip Below Profits

The year 1954 was the first since 1949 that the steel industry was able to keep more money than it paid the federal income tax collector. This turn for the better stems from elimination of the federal excess profits tax at the end of 1953 and a high amortization of facilities covered by certificates of necessity under the Defense Production Act. In 1954, the 33 producers set aside \$556,249,405 for federal income taxes, while keeping \$605,625,835 as net income. In 1953, their federal income taxes were \$943,551,758, compared with a net income of \$696,393,472.

The increase in fast amortization is reflected in the total provision for depreciation of \$655,700,994 by the 33 companies in 1954, compared with \$598,869,504 in 1953.

Although 17 of the 33 companies

reduced their long-term debt in 1954, this item went up \$173.3 million, largely because of U. S. Steel Corp. That company boosted its debt \$259.6 million through the sale of \$300 million worth of debentures for the restoration of working capital and other corporate purposes.

With the reduced rate of steel production, employment and employment costs declined in 1954. The average number of employees dropped 11.18 per cent, while employment costs fell 15.03 per cent. The drop in employment costs, despite a midyear wage increase, came from the elimination of overtime pay and reduced hours of work.

More Stock, Fewer Owners

Common and preferred stock ownership was concentrated in fewer hands in 1954. Although the long-term trend in the number of preferred stockholders has been down, common stock ownership had been on the way up until 1954, when the number of common stockholders declined 1.2 per cent, but the number of common shares outstanding continued to increase, with a gain of 3.3 per cent over 1953.

Current assets mounted and current liabilities ebbed in 1954, increasing working capital 29.17 per cent over that of 1953. In 1954, there were \$2.67 of current assets for every dollar of current liabilities, compared with \$1.95 in 1953.

THIS SPECIAL REPORT is compiled from data from 33 producers representing 94.1 per cent of the steelmaking capacity in the United States

	Rated Ingot Capacity, Net Tons		Ingot Production, Net Tons		Steel Operating Rate, Per Cent		Net Income Per Ingot Produc-	
	1954	1953	1954	1953	1954	1953	1954	1953
United States Steel Corp.	38,877,000	38,715,000	28,355,000	35,827,000	73.20 ⁸	98.40 ⁸	\$6.89	\$6
Bethlehem Steel Corp.	18,500,000	17,600,000	13,810,076	17,662,687	74.65	100.36	9.62	7
Republic Steel Corp.	10,262,000	10,262,000	6,972,812	9,630,454	69.80 ⁸	94.50 ⁸	7.58	5
Jones & Laughlin Steel Corp.	6,166,500	6,166,500	4,570,000	6,033,000	74.11	95.97 ⁸	5.48	5
National Steel Corp.	6,000,000	5,650,000	NA	NA	NA	NA	NA	NA
Youngstown Sheet & Tube Co.	5,520,000	5,520,000	3,868,525	5,091,876	70.08	102.92 ⁸	5.22	6
Armco Steel Corp.	4,950,000	4,902,000	4,448,772	4,704,773	89.87	95.98	9.24	7
Inland Steel Co.	4,700,000	4,500,000	4,522,257	4,513,076	96.21	100.29	9.13	7
Colorado Fuel & Iron Corp. ⁴	2,469,035	2,311,785	1,845,693	2,130,451	74.75	92.16	3.82	3
Wheeling Steel Corp.	2,130,000	1,860,000	1,589,643	1,797,419	74.63	96.63	6.04	6
Sharon Steel Corp.	1,550,000	1,550,000	846,515	1,527,706	54.61	98.56	3.70	4
Kaiser Steel Corp. ⁴	1,536,000	1,536,000	1,382,877	1,458,904	90.03	100.06 ⁸	5.73	6
Pittsburgh Steel Co.	1,404,000	1,404,000	1,070,386	1,037,335	76.24 ⁸	86.40 ⁸	2.03	4
Crucible Steel Co. of America	1,351,400	1,351,400	NA	NA	NA	NA	NA	NA
Granite City Steel Co.	1,080,000	932,000	634,909	937,801	58.78	100.62 ⁸	6.32	6
McLouth Steel Corp.	960,000	579,700	434,319	528,733	56.42 ⁸	91.21	3.90	9
Barium Steel Corp.	893,000	893,000	237,000	497,790	26.54	55.74	10	10
Allegheny Ludlum Steel Corp.	864,200	864,200	431,068	680,619	49.88	78.76	9.85	11
Northwestern Steel & Wire Co. ⁵	825,000	825,000	308,780	440,503	37.43	53.39	3.30	3
Newport Steel Corp. ⁶	708,537	708,537	154,658	528,024	21.82	74.52	.40 ^f	4
Lukens Steel Co. ⁷	675,000	675,000	631,834	763,879	93.60	113.17	3.19	4
Detroit Steel Corp.	660,000 ¹¹	660,000	442,753	529,044	67.08	80.16	2.67	9
Alan Wood Steel Co.	625,000	625,000	345,918	598,334	55.35	95.73	3.60	5
Copperweld Steel Co.	618,380 ¹²	618,380 ¹²	18	18	13	18	18	18
Lone Star Steel Co.	550,000	550,000	379,009	195,155	68.91	35.48	2.66 ^f	10
Laclede Steel Co.	500,000	440,000	396,023	427,514	79.20	97.16	7.43	6
Rotary Electric Steel Co.	425,000	425,000	172,916	299,776	40.69	70.53	10.70	7
Keystone Steel & Wire Co.	425,000	425,000	334,444	356,969	78.69	83.99	18.28	11
Continental Steel Corp.	394,000	394,000	336,149	362,048	85.32	91.89	5.93	4
Midvale Co.	324,947	353,373	39,209	79,131	12.07	22.39	18.49	17
Atlantic Steel Co.	300,000	300,000	169,353	261,918	56.45	87.31	4.56	1
Carpenter Steel Co. ⁴	76,731	76,731	55,413	73,503	72.21	95.79	45.91	43
Vanadium-Alloys Steel Co. ⁴	42,000	42,000	13,356	13,716	31.80	32.66	104.87	79
Total (or average)	116,362,730	113,715,606	78,799,667	99,499,182	72.70	93.78	\$7.24	\$6

	Number of Shares of Common Stock Outstanding		Common Stock Valuation		Preferred Stock Valuation	
	1954	1953	1954	1953	1954	1953
United States Steel Corp.	26,391,022	26,109,756	\$879,700,733	\$870,325,200	\$360,281,100	\$360,281,100
Bethlehem Steel Corp.	9,582,942	9,582,942	303,459,830	303,459,830	93,388,700 ¹⁴	93,388,700 ¹⁴
Republic Steel Corp.	7,325,956	5,952,919	171,252,702	137,024,601	None	28,204, ¹⁵
Jones & Laughlin Steel Corp.	6,196,554	6,200,654	61,906,000	62,007,000	29,357,000	29,357,000
National Steel Corp.	7,362,045	7,362,045	73,620,450	73,620,450	None	None
Youngstown Sheet & Tube Co.	3,353,546	3,350,016	105,243,374	105,088,053	None	None
Armco Steel Corp.	5,229,574	5,214,989	52,295,736	52,149,886	None	None
Inland Steel Co.	5,215,967	4,907,654	78,016,383	62,852,323	None	None
Colorado Fuel & Iron Corp. ⁴	2,603,462	2,478,084	13,017,911	12,391,021	11,929,278	12,043,3
Wheeling Steel Corp.	1,425,173	1,423,897	37,054,498	37,021,322	35,752,600	35,752,600
Sharon Steel Corp.	1,100,000	1,100,000	11,060,390	11,060,390	None	None
Kaiser Steel Corp. ⁴	3,200,000	3,200,000	3,200,000	3,200,000	39,540,375	40,000,0
Pittsburgh Steel Co.	1,386,644	1,281,208	14,525,692	12,847,236	24,194,300	24,194,300
Crucible Steel Co. of America	821,784	687,180	20,544,607	17,179,514	27,605,500	29,436,7
Granite City Steel Co.	1,640,409	1,544,044	20,566,605	19,398,588	12,125,600	12,135,
McLouth Steel Corp.	1,189,600	1,189,600	2,974,000	2,974,000	27,000,000	None
Barium Steel Corp.	3,082,737	2,299,859	3,082,737	2,299,859	None	None
Allegheny Ludlum Steel Corp.	1,689,360	1,689,358	1,689,360	1,689,358	8,134,500	8,134,6
Northwestern Steel & Wire Co. ⁵	817,825	817,825	4,089,125	4,089,125	None	None
Newport Steel Corp. ⁶	1,065,491	1,078,546	1,065,491	1,078,546	None	None
Lukens Steel Co. ⁷	317,976	317,976	3,179,760	3,179,760	None	None
Detroit Steel Corp.	2,419,017	2,419,017	2,419,017	2,419,017	None	None
Alan Wood Steel Co.	656,053	624,812	6,560,530	6,248,120	6,312,900	6,457,5
Copperweld Steel Co.	515,188	515,188	2,575,940	2,575,940	4,227,750	4,336,9
Lone Star Steel Co.	2,640,000	2,640,000	2,640,000	2,640,000	None	None
Laclede Steel Co.	206,250	206,250	4,125,000	4,125,000	None	None
Rotary Electric Steel Co.	348,350	348,350	3,483,500	3,483,500	None	None
Keystone Steel & Wire Co.	1,875,000	1,875,000	2,604,167	2,604,167	None	None
Continental Steel Corp.	501,361	501,361	7,018,789	7,018,789	None	None
Midvale Co.	600,000	600,000	10,574,621	10,574,621	None	None
Atlantic Steel Co.	100,000	100,000	1,000,000	1,000,000	700,000	700,0
Carpenter Steel Co. ⁴	427,248	427,125	2,136,240	2,135,625 ²⁰	None	None
Vanadium-Alloys Steel Co. ⁴	422,299	412,157	2,000,000	2,000,000	None	None
Total (or average)	101,708,833	98,457,812	\$1,908,683,188	\$1,841,760,841	\$680,549,603	\$684,422,9

Boldface type is used under those columns in which figures from all 33 companies were not received. NA=Not Available.

*Denotes a credit. †Denotes a deficit.

¹ Excluding amount maturing within one year.

² After federal income taxes but before interest on funds.

³ Including funded debt due within one year.



Inc., Elkhart, Ind.; and Voyles Equipment & Engineering Inc., Indianapolis.

Reynolds Metals Co., Louisville, appointed Congdon & Carpenter Co., Providence, R. I., distributor of aluminum mill products, including flat and corrugated aluminum sheet, plate, rod, bar, tubing and pipe.

Pacific Airmotive Corp., Burbank, Calif., manufacturer of air conditioning and pneumatic equipment, appointed Russell Associates, Brightwaters, N. Y., a sales representative.

Parker Appliance Co., Cleveland, appointed Hope Rubber Co. Inc., distributor of tube fittings. Hope Rubber has warehouses in Fitchburg, Holyoke and Watertown, Mass.

Amerigear-Zurn Inc., Erie, Pa., appointed W. J. Bernhart Co., Buffalo, sales representative for flexible couplings and allied power transmission products.

Copes-Vulcan Division, Continental Foundry & Machine Co., Erie, Pa., appointed Central Pump & Equipment Co., St. Louis, representative for all its products.

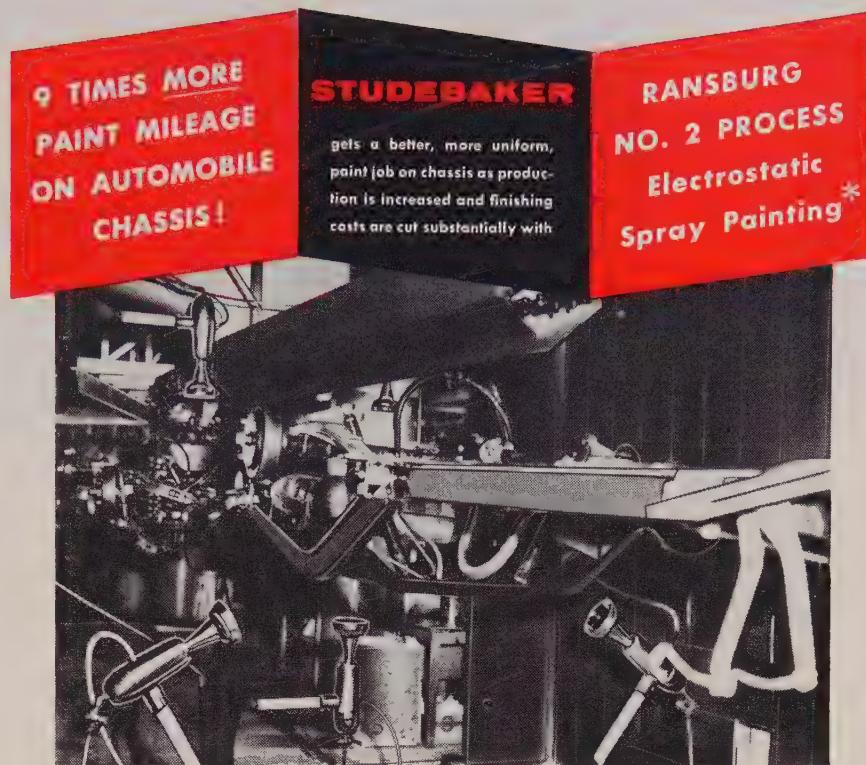
Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif., appointed R. Lavin & Sons Inc., Chicago, distributor of standard alloy ingots.

Leland-Gifford Co., Worcester, Mass., appointed Ernst Machinery Co., Kansas City, Mo., its representative for drilling machines in western Missouri and Kansas.

Freeman & Sons Inc., Miami, Fla., a Hyster Co. dealer, opened a new branch in Lakeland, Fla., to cover its expanded territory.

Arwood Investment Casting Corp., Brooklyn, N. Y., appointed Carl H. Schmidt Co., Detroit, its sales representative in that area.

Allis-Chalmers Mfg. Co.'s General Machinery Division, Milwaukee, named Bickford & Francis Belting Co. Inc., Buffalo, distributor for V-belt drive equipment.



● When Studebaker Division, Studebaker-Packard Corporation switched to Ransburg No. 2 Process of Electrostatic Spray painting on their automobile chassis, paint mileage was increased 9 times.

By simply putting the paint where it's supposed to go, Studebaker cut daily paint consumption on the chassis production line from 14½ drums to 1½ drums. And, still they are painting 6 more chassis per hour with the No. 2 Process.

In addition to getting better, more uniform coverage with the asphalt-type coating, paint and labor costs were cut 70¢ per chassis. In eliminating the former set-up with 2 water wash booths and 12 automatic spray guns, they save nearly 1000 square feet of badly needed floor space.

Another on-the-job-example of the unmatched efficiency of the Ransburg No. 2 Process in which quality of the work is improved . . . AT LESS COST!

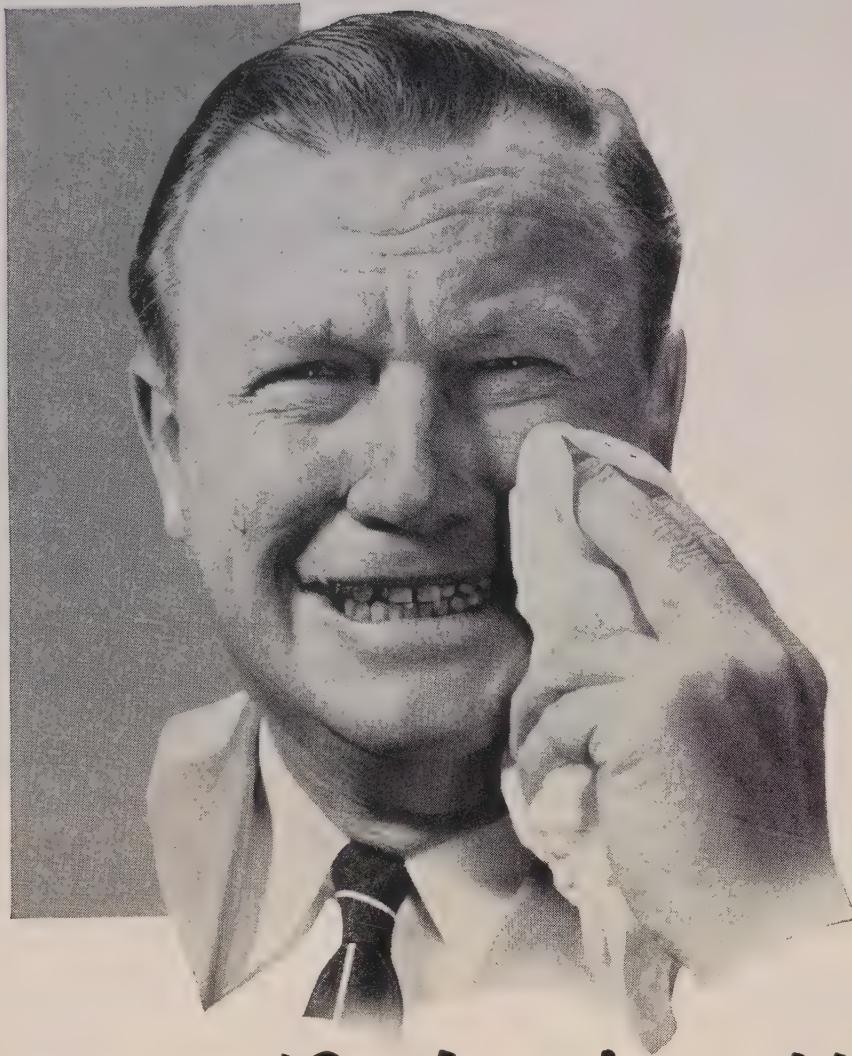
* Studebaker also uses the Ransburg method to apply a heavier and more uniform primer surfacer on automobile bodies.

Whatever your product—large or small—if your production justifies conveyorized painting, it's possible that one of the Ransburg electrostatic processes can do the job better, with substantial savings to you. We'll be glad to tell you about complete Ransburg services.

Write to Dept. S.

Ransburg
ELECTRO-COATING CORP.
Indianapolis 7, Indiana





Embarrassed? Man, I could cry!

"One day the Detrex man mentioned that metal cleaning and surface preparation represented from $\frac{1}{4}$ to $\frac{1}{3}$ of the operations in most metalworking plants. Well sir, I just didn't believe him and took a count to prove him wrong—only I didn't! In fact when I think of the money I lost because I paid so little attention to the importance of these operations, I could really cry.

"In our plant over a quarter of the operations performed fell into one of these two categories. As a result, this metal cleaning business represents big money to us every year—even small savings on each operation represents mighty big savings overall. And mister, Detrex cut our costs on nearly every one.

"Take our phosphate coating operations prior to painting as an example. Detrex Paintbond* is saving us hun-

dreds of dollars per year because it goes so much further. At the same time Paintbond gives us a finer crystalline coating and thus a smoother, more lustrous paint finish. Salt-spray tests? . . . better than ever.

"If you've never stopped to count the number of metal cleaning and surface treatment operations in your plant (or the money you might save on them) chances are you'll be shocked.

"Tell you what—the Detrex man in your territory will make the same kind of a survey in your plant. Why not give him a crack at it? You don't owe him a plugged nickel if he doesn't prove his point. What if he does?, you ask. Then he'll sell some chemicals and/or equipment and you'll save BIG dollars. How about giving it a whirl, today? You have everything to gain, nothing to lose."

*Above is shown the attractive three-color label which Detrex provides to users for application on finished products. At point-of-purchase, this label tells your customers that your product has a durable finish that will give a life time of pleasure. It's an added sales clincher every time.

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ALKALI & EMULSION CLEANERS • DRYCLEANING
EQUIPMENT • PHOSPHATE COATING PROCESSES

April 11, 1955

Technical Outlook

TITANIUM PREDICTION—Price of titanium sponge will be substantially lowered and that of mill products will be cut one-half or more during the next three to five years . . . the prediction was made by Dr. Walter L. Finlay, vice president, Rem-Cru Inc., speaking at the titanium panel session at the Ninth Western Metal Congress in Los Angeles. Two "ifs" are in the picture: 1. If the present gap between oversupply of sponge and the puny demand for mill products is promptly closed. 2. If total demand for mill products gets up to 10,000 to 20,000 tons a year.

PRECISE HEATING—A conveyor-type electric furnace gives day-in-day-out heating control within $\pm 3^\circ \text{ F}$. It's used to treat electronic parts in three separate zones, ranging from 800 to 1500° F.

3-D DRAFTING—A Long Island firm is making hay because of the average man's inability to visualize blueprints in three dimensions and full color. Starting with basic designs before the details are frozen, the company employs "pictorial engineering" — perspective phantom drawings in color—to help designers get their ideas from paper into production.

SUGGESTIONS, PLEASE—Operators of Air Force heavy presses are wondering what to do with them when they aren't busy with military orders. There aren't many obvious civilian requirements for die forgings big as a diningroom table. Any suggestions?

CLOSE SHAVE—A 50-ton inventory of electric shaver parts, enough to keep Schick Inc. in production while it moves operations from Stamford, Conn. to Lancaster, Pa., could present a terrific corrosionproofing job. Grease was out of the question. Schick uses corrosion-inhibiting papers supplied by Westwill Co., Westport, Conn.

Parts come off the production line and are packed immediately in cartons lined with the paper. Guarantee: Parts will stay in good condition even though some won't be used for six months.

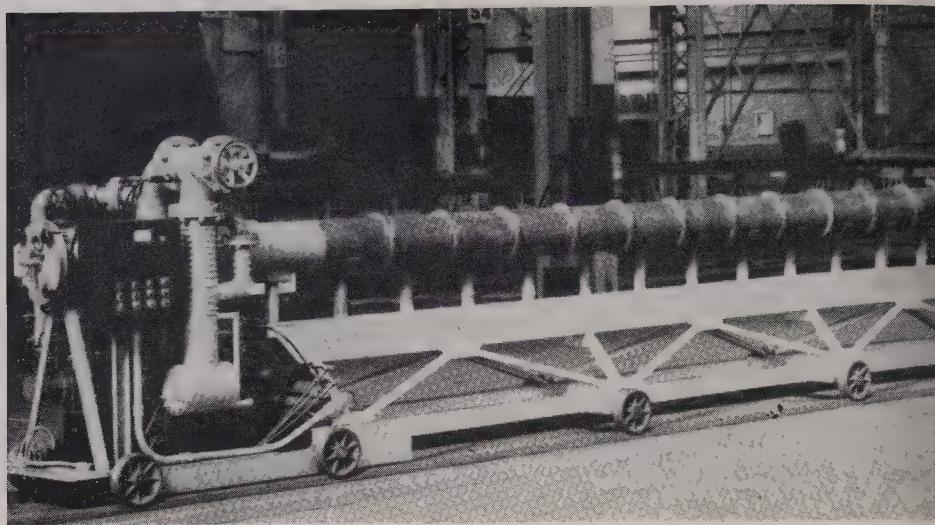
TINY TUBING—Cold-drawn, seamless nickel tubing, so small that a stream of air bubbles helps you find it in a container of water, drew a crowd at the recent Institute of Radio Engineers convention. The tubing has an OD of 0.0014 in. and an ID about one-third the thickness of human hair. If you've got a use for it, contact Superior Tube Co., Norristown, Pa. The first batch was made as an experiment.

ALL-RUBBER INSULATION—Allis-Chalmers Mfg. Co. announces the first all-silicone-rubber insulating system for large motors and generators. Combinations of glass tapes, mica and silicone resin compounds have been used for some time, but this innovation adds the flexibility and resilience of rubber to the insulation. Technique development soon will widen the application range beyond 2300 and 4000-volt classes now available.

TACONITE BLASTER—A new liquid oxygen blasting method for fragmenting tough taconites was patented last week. In contrast with the conventional cartridge charging method, liquid oxygen and carbon are mixed in the blast hole itself. Liquid oxygen explosives have been extremely dangerous, but inventor L. P. Barlow claims his system eliminates hazards.

PRESSURE BUBBLES—A 650 cu-in. ball of yarn weighing only 12½-lb holds 3000 psi of air pressure. Walter Kidde & Co. Inc. makes them by impregnating glass-fiber yarn with epoxy resin, winding the yarn around an inflated rubber liner, then heat-curing the resulting shell. Big use: Aircraft pneumatic systems.

Vacuum Heat Treating I



This 24-ft-long vacuum furnace heat treats tubing. Pumping system is shown at right.

Opportunity Knocks in the Micro

By RICHARD L. HOFF and A. M. BOUNDS
Superior Tube Co.
Norristown, Pa.

NONE OF THE usual prepared atmospheres is inert to metal being heat treated. All are mixtures of chemically active gases.

For this reason, prepared atmospheres cannot be used with the so-called reactive metals—titanium, zirconium, vanadium, tantalum, niobium (columbium)—and the radioactive elements. Their heat treatment requires inert atmospheres or a vacuum.

The advantages of vacuum heat treating extend to many common metals. It is valuable for precipitation-hardening alloys and metals going into electronic tubes.

Specifics—Take the solution and precipitation hardening of several age-hardening alloys. For materials like beryllium-copper, K-Monel, Inconel-X, Ni-Span-C, Elinvar-type alloys (42 per cent nickel, 5 chromium, 2½-titanium) and cobalt-base beryllium alloys, vacuum prevents the conversion of titanium, aluminum, beryllium to gas metal compounds.

This means the full hardenability of these alloys is preserved down to the thinnest sections, such as watch springs and instrument diaphragms.

Broad—Any alloy containing elements which combine with gases in prepared atmospheres is a potential vacuum candidate.

Vacuum heat treating may prevent the formation of unwanted compounds—this utilizes the protective feature of vacuum.

Or it may dissociate compounds which already have been formed in the metal—this utilizes the degassing feature.

With some metals, advantages stem from changes in surface films or the removal of impurities to give better mechanical properties.

Extracts—Vacuum heat treating extracts surface contaminants and processing lubricants that are difficult to remove by other means. Example: Annealing large coils of aluminum foil. Here, rolling oils are extracted under vacuum with-

out uncoiling.

One aircraft company is putting in vacuum equipment for copper brazing Inconel to stainless steel. Vacuum reduces surface tension and prevents oxidation and nitriding which interfere with brazing.

In the case of titanium and zirconium, vacuum heat treating not only prevents absorption of embrittling interstitial alloying agents but also removes hydrogen if it has been absorbed.

New Light—Experience with boron steels indicates (Reference 1) that bars austenitized in vacuum do not show deboronization at the surface as do samples treated in air and in conventional atmospheres.

This suggests vacuum heat treatment to prevent deboronization and that perhaps data on boron steels should be regarded in a new light.

Principles—In comparing vacuum with prepared atmosphere heat treating, we must start with entirely new concepts.

Prepared atmospheres, their control and effect on the work depend on chemistry—chiefly physical chemistry. In contrast, vacuum technology depends upon physics.

To make a rough comparison, we

For Your File

Extra copies of this article and part II, which will appear next week, are available in quantities from one to three until supply is exhausted. Write: Technical Editor, STEEL, Pentagon Bldg., Cleveland 13, O.

Range

now substitute vapor pressures of metals for carbon potential of prepared atmospheres. We substitute dissociation pressures of compounds for chemical reactions between elements and gaseous compounds. These concepts, while no more difficult than the chemical reactions in prepared atmospheres, are perhaps a little less familiar.

Explained—A good example of the effect of vapor pressure is that water boils at a lower temperature at high altitude than at sea level. The vapor pressure of the water is the same at high altitude as at low. But the opposing pressure of the atmosphere is lessened, and the vapor pressure of the water matches that of the atmosphere at a lower temperature.

In a similar way, the vapor pressure of metals is fixed with definite values at a given temperature. But if we remove the pressure of the atmosphere which opposes these pressures, then the metal evaporates more rapidly.

Some metals like zinc, magnesium and lead have high vapor pressures. If we heat them in vacuum, they evaporate or sublime rapidly. It's obvious then that vacuum heat

treatment is no cure-all. It is not applicable to many metals and alloys.

Different—Vapor pressure of the pure metals is well cataloged (Ref. 2), but the vapor pressure expected from an alloy is generally not so well understood. The vapor pressure of an alloy is governed in part by a law analogous to Dalton's law of partial pressures: "The total vapor pressure of an alloy is equal to the sum of the partial vapor pressure of its constituents, but the partial pressure of each component of the alloy is lower than the normal vapor pressure which the element would exert if it were not contained in an alloy."

Another law is important: Ac-

cording to Raoult's law, as applied to dilute solutions, the vapor pressure of the solution is lower than that of the pure solvent by an amount which is proportional to the concentration of the solute.

Example—Thus, the maximum vapor pressure of a solid solution alloy may be calculated on the basis of vapor pressure of the constituents. The partial pressure of some of the major constituents of Type-304 stainless steel at 1500° F is given in Table 1, based on Dushman's data (Ref. 3).

Manganese in the stainless steel used in Table 1 would theoretically have a maximum vapor pressure of 18 microns at 1500° F; hence, it would evaporate rather rapidly.

TABLE I
Maximum Vapor Pressure of Type-304 Stainless Steel Components
(1500° F)

Element	Weight Per cent*	Maximum Vapor Pressure Millimeters	Maximum Vapor Pressure Microns
Manganese	1.33	1.850×10^{-4}	18.5
Silicon	0.46	0.00637×10^{-4}	0.06
Copper	0.25	0.00023×10	0.002
Chromium	19.12	0.0756×10^{-4}	0.75
Nickel	9.62	0.0008×10^{-4}	0.008
Iron	69.11	0.0007×10^{-4}	0.007
Carbon	0.07	600.000×10^{-34}	nil

*Heat X46523

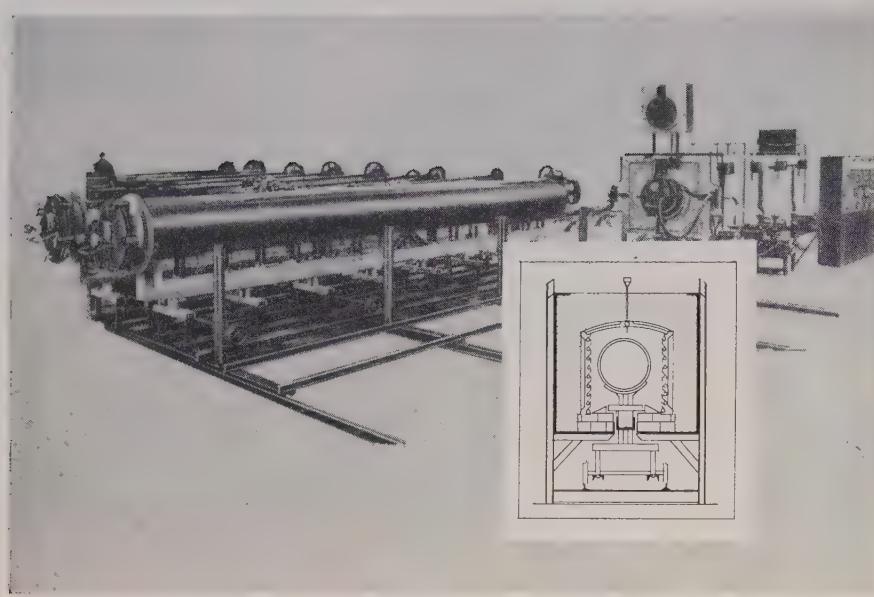


Fig. 2—Economic factors (high cost of ammonia and its lack of availability) dictated installation of this multiple-retort vacuum furnace in Germany. It is used in regular production of wire and tubing

The fact that this does not occur to a serious extent in practice suggests that manganese evaporation is diffusion rate limited. This means that little manganese is lost in the relatively short heating cycles generally used. The other elements would evaporate but little during vacuum heat treatment.

Opposite—An examination of the vapor pressure of 70-30 brass, on the other hand, shows that vacuum annealing gives dezincification.

These examples say that a knowledge of vapor pressure data is of first importance in vacuum heat treating metals.

Another Factor—A second concept is also important: The significance of dissociation pressures of compounds.

Some rather unstable compounds seem to be literally held together by the pressure of the atmosphere. If we place them in a vacuum, they break down into their components.

Compounds—This is particularly true if one of the components is ordinarily a gas like oxygen, nitrogen or hydrogen. Just as the elements have a definite vapor pressure at a definite temperature, so do the various compounds have a definite and measurable dissociation pressure.

If the pressure in an evacuated vessel is less than the dissociation pressure of the compound, then the compound will break down into its components. Given enough time, it

will be completely dissociated.

No Effect—If, on the other hand, the pressure in the vessel is higher than the dissociation pressure of the compound, vacuum heat treating will have little effect on the compound.

Unfortunately, many of the metal oxides are extremely stable. This means that you have to go to extremely low pressures to affect dissociation. You may find that it is impossible to dissociate the compounds at any practical degree of vacuum or temperature (Ref. 4).

Fortunately, the nitrides and hydrides of most common metals have high dissociation pressures, and are not stable in vacuum. For this reason, we can use vacuum heat treating to dissociate such compounds and remove the gases evolved.

Recap—Keep these points in mind: In vacuum heat treatment, we may prevent the formation of unwanted compounds—this utilizes the protective feature of the vacuum.

Or we may dissociate compounds which already have been formed in the metal—this utilizes the degassing feature of the vacuum.

What You Need—Vacuum heat treating equipment consists essentially of four components:

1. A suitable batch-type furnace

—it may be electric resistance or gas fired.

2. A vacuum-type retort or container—sometimes furnace and container are an integral unit.
3. A mechanical vacuum pump to give a rough vacuum of from 50 microns to 1 mm mercury pressure (1 micron is 0.001 mm of mercury pressure).
4. A vapor diffusion pump to give a good vacuum of the order of 20 microns down to as low as 0.01 micron.

Getting Set Up—Details of construction will vary widely, but a number of features should be given consideration:

One is retort design. The pressure of the atmosphere may seem scarcely significant in ordinary design work, but this pressure of 14.7 psi constitutes a surprisingly large load on a vessel which may have a yield strength of only 2000 or 3000 psi at a temperature of 1800 to 2000°F. Round vessels are the strongest. Strength of the container must be carefully calculated to make sure it will not collapse at the maximum operating temperature.

Another Point: The area of the ports leading to the vacuum pumping system, and the shape and the length of the container, have an effect on the pumping speed and degree of vacuum obtainable. Ports should be as large as possible. Sometimes they are as large as the diameter of the vessel itself.

The selection of the diffusion pump depends on the volume of the vessel, the type and amount of gas to be handled and the ultimate degree of vacuum needed. A balance between diffusion pump jet design, type of liquid and operating temperature may be selected to meet these requirements (Ref. 5).

World War II prompted the development of large, rugged mechanical and diffusion pumps which will evacuate large chambers to lower pressures than could be obtained in small glass systems previously.

Check This—Diffusion pump ratings are based on the volume of air handled at an arbitrary

pressure. These data are difficult to interpret.

For example, a booster-type diffusion pump may have a pumping rate of 5000 cfm at 5 microns pressure. This sounds like a large capacity, but remember this is only 0.032 cfm at atmospheric pressure, and considering the amount of gas contained in some metals, such a pump might be entirely too small.

Here's another factor: It is much more difficult to evacuate a vessel containing hydrogen than one containing air. The rating of a pump used for removing hydrogen from a metal may be only a fraction of its capacity when handling air.

Example — Fig. 1 shows the pressure changes obtained in a 24-ft vessel 10 in. in diameter when hydrogen, helium and argon are allowed to enter it through a controlled leak.

Pumping speed depends upon the operating pressure and type of gas in the system. This means pressure readings are only relative and do not indicate the actual quantities of gas removed. Another point: Curves in Fig. 1 show that the rate of hydrogen removal from an evacuated vessel may be improved by the addition of a heavier inert gas such as argon.

Gages—An important accessory of a pumping system is the vacuum gage. Because thermocouple-type gages (Ref. 6) are small and easily connected to various parts of the system, and because they give an electrical indication of

pressure which can be easily connected to a permanent recording device, they are frequently used in industrial work.

The electrical output of such a gage is proportional to the square of the pressure. Thus, it is evident that they are inaccurate at low pressures. By comparison to McLeod-type mercury gages, they usually read high.

Most vacuum heat treating does not require pressures below 1 micron. Thermocouple gages are adequate to show uniformity between various furnace cycles in that range.

Typical Furnaces — What do vacuum heat treating furnaces look like? The furnace in Fig. 2 is a multiple retort system built about 1938 in Germany. It has been used in regular production of wire and tubing ever since.

This installation was made because of the relatively high cost of hydrogen and the unavailability of ammonia. In other words, the installation was dictated almost entirely by economic considerations rather than technical ones.

Another Type—Fig. 3 shows a small double retort furnace for heat treating precipitation-hardening alloys. Since many such alloys depend upon intermetallic compounds formed between the base metal and such reactive metals as beryllium, aluminum and titanium, the need to prevent them from reacting with oxygen, nitrogen and hydrogen is obvious.

Basis—At Superior Tube Co., we feel that the reactive metals titanium, zirconium and others should not be heat treated in a reactive atmosphere where the section thickness is $\frac{1}{8}$ -in. or less.

For annealing of such metals, we installed in the fall of 1953 a production-size vacuum furnace that takes a retort 10 in. in diameter and 24 ft long. It will handle loads up to 1000 lb.

This furnace, shown at top of page 108, uses a 100 cfm mechanical pump and a 6-in. booster-type diffusion pump. It gives a vacuum of 0.5 micron.

Booster Pump—To handle the volume of gas from large quantities of reactive metal tubing, a booster pump was selected in pref-

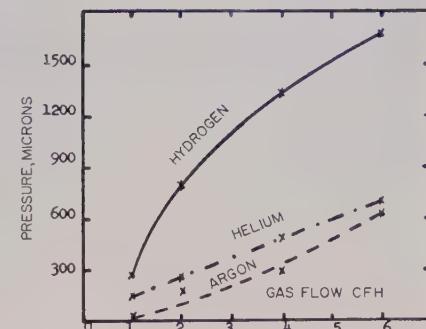


Fig. 1—Pumping speed in a vacuum furnace depends upon operating pressure and type of gas. Curves show pressure change in a 24-ft vessel 10 in. in diameter when hydrogen, helium and argon enter through a controlled leak

erence to the normal diffusion pump because of the larger pumping capacity. It will operate at pressures as high as 800 microns. This compares to an upper limit of about 200 microns for the usual diffusion-type pump.

This resistance-type furnace is divided into three zones. Each has its own recording temperature controller. The retort can be pumped down to a few microns pressure in 10 to 15 minutes, which is about the time required for the booster pump oil to come up to temperature.

By using the by-pass valves, the diffusion pump can be held under vacuum by means of a small holding pump. When operated in this manner, pump down time can be reduced to as little as 5 or 6 minutes.

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This article is based on a talk used in a Vacuum Metallurgy Symposium at the 106th meeting of the Electrochemical Society in Boston.

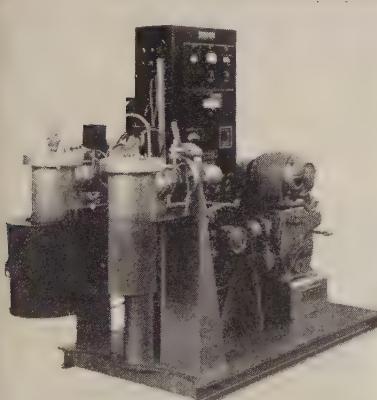
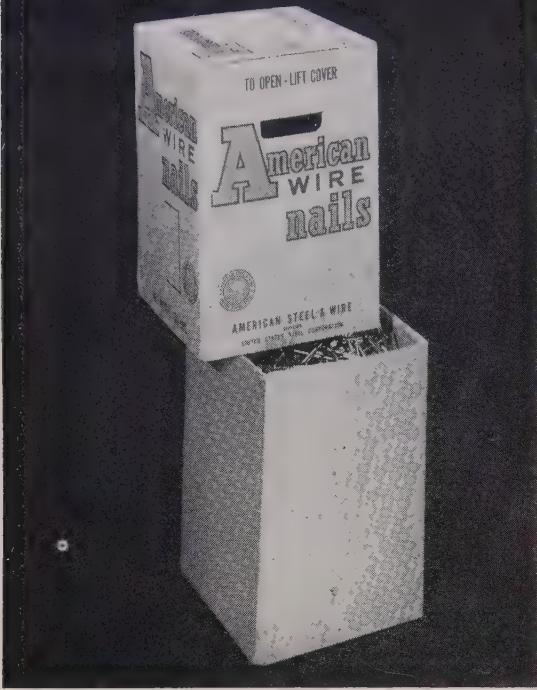


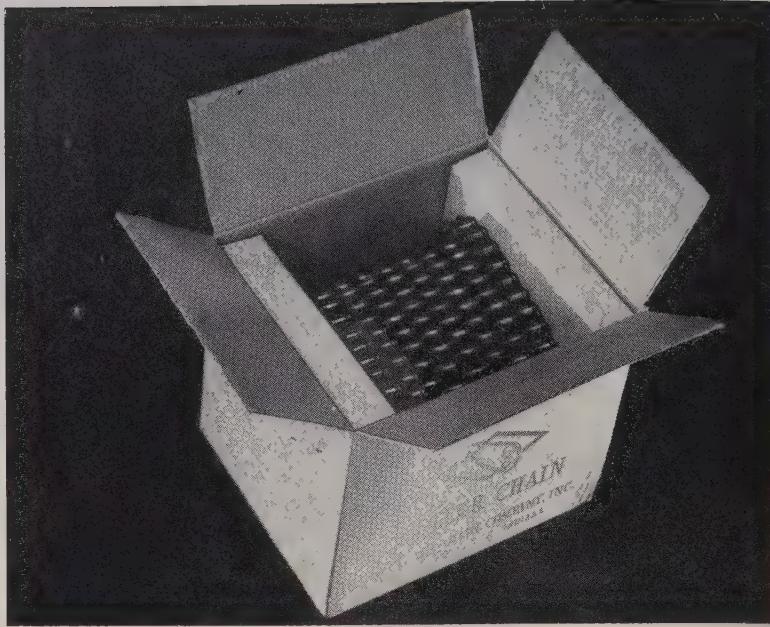
Fig. 3—This double retort furnace is used for heat treating precipitation-hardening alloys

Next Week,

Messrs. Hoff and Bounds will discuss applications and results of vacuum heat treating.



Some of the nation's largest makers of nails package their product in corrugated containers



Fiber spool for roller chain reduces packaging costs 15 per cent. It later serves as a dispenser at point of sale

FIBER BOXES:

Low-Cost, Efficient Packaging

The 24th National Packaging Exposition will be held Apr. 18-21 at the International Amphitheatre, Chicago. Running concurrently will be the Annual American Management Association Packaging Conference, to be held Apr. 18-20 in Chicago's Palmer House. Conference registrations can be made at the Palmer House beginning Apr. 18, or by writing American Management Association, 330 W. 42nd St., New York 36, N. Y.

ONE MORNING, three years ago, 1000 lb of nuts and screws were found scattered on the floor of a freight car. The night before, four wooden kegs had fallen apart.

This incident was the last in a series of annoyances that plagued the Parker-Kalon Division of General Transportation Corp. The wooden keg wasn't doing its job for them. Breakage was frequent. Storage of empty kegs was a headache.

The Answer—The company set out to find a substitute that would stand up under the weight of 250 to 300 lb of steel. When company representatives saw fiber boxes

tossed, tumbled, jarred and dropped without sustaining damage, they knew they had the answer. The clincher came when a container, filled with 300 lb of steel, was dropped 8 ft without harm to its contents.

During the last three years, Parker-Kalon reports an over-all savings of 35 to 45 per cent due to use of corrugated containers.

Motor Package—General Electric Co. uses fiber boxes to ship its 5-hp integral motor. Savings result, the company reports, from the elimination of lifting and bolting the motor to a wooden skid, an initial cost lower than that of

other packaging equipment and because the carton can be sealed with automatic equipment.

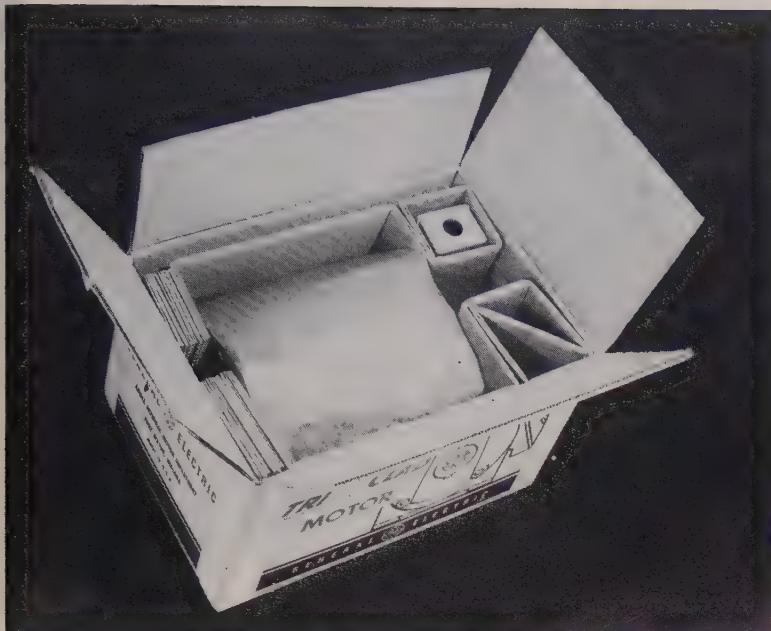
GE solved another problem through the use of fiber containers. Once the carton is sealed, dust can't get into a motor's delicate mechanism. Other shipping containers couldn't be sealed tightly enough without a great deal of time and expense. Now it's a matter of seconds.

Another Use—Diamond Chain Co. Inc., Indianapolis, found a new use for fiberboard. It markets roller chain on corrugated fiberboard reels. Chains in 25 to 50-ft lengths are offered in this fashion.

Reels are supplied to Diamond Chain as flat die-cut sheets. These self-locking spools are assembled in its plant without stapling, taping or gluing. Loads up to 60 lb are shipped without damage.

Chain can be unwound easily by inserting a rod through the core and suspending the reel on wall brackets or floor stand.

Special Aid — Manufacturers



Packaging motor in fiber container eliminates need for lifting and bolting the product to a wooden skid



Fiberboard brace prevents movement of the inner tube of this automatic washing machine

have developed fiber boxes to hold and protect 10 and 25-hp outboard motors, dies, bearing chains and other high-density products. Usually, they are developed in answer to specific calls for help.

The fiber box which replaced

the nail keg is also used by American Steel & Wire. Cleveland Chain Mfg. Co. uses it for shipping bulk chain. Western Automatic Machine Screw Co., Elyria, O., uses it to ship cap screws, nuts and screw machine products.

Other items shipped in the corrugated containers include a 700-lb safe, all-metal TV cabinets, washing machines and dryers, steel kitchen sinks and steel desks. Expendable pallets for shipping steel are a recent application.

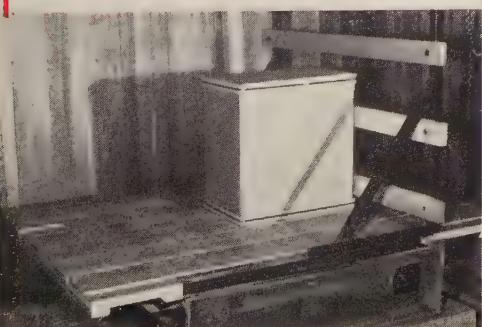
How do shippers know fiber containers will safely protect their merchandise? Because the boxes are given rigid laboratory tests. Four tests are shown (read from right down to left corner).

Revolving Drum—Containers are tumbled about in a manner simulating manual handling. They fall from one of the six faces to the next as the drum revolves slowly. Baffles cause the containers to strike flat, on corners and on edges in succession.

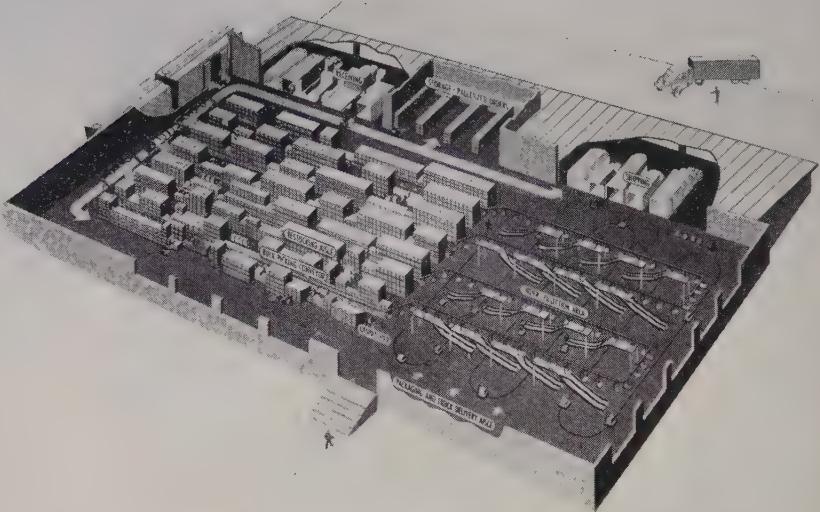
Drop Tester—The two hinged flaps can be held horizontally and released simultaneously so they swing down quickly. Containers can be dropped flat, edgewise or cornerwise onto a solid base from any selected height.

Impact Tester—A dolly on tracks inclined at a 10-degree slope carries the container to any selected distance up the incline before it is released. The filled container strikes the solid base at right angles across the track. This simulates shocks in freight cars or trucks during sudden stops or starts.

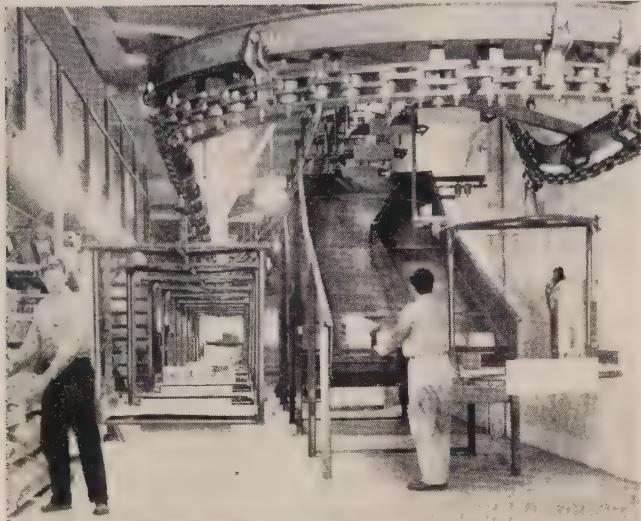
Vibration Table—This table is actuated to give it a motion like the floor of a freight car or truck.



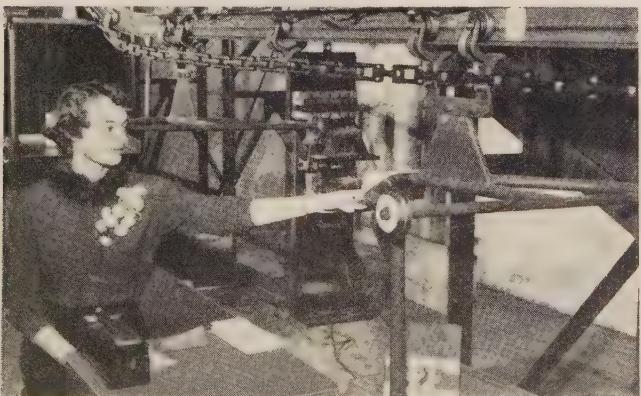
Electronics Runs The Warehouse



Here's what a typical automated setup looks like



Man at left is working through his stack of order cards, bin by bin. Punched card will accompany each item quantity on an individual conveyor tray



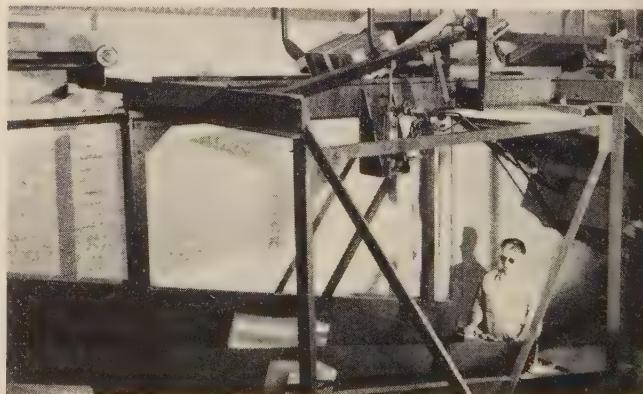
As each item quantity passes the dispatcher, order card is placed in an electronic reader which tells the conveyor tray in which chute the order is being gathered. When tray reaches that chute, right, items are unloaded automatically. A roving team of packers prepares each order for shipment

SWITCHING from conventional order picking to bulk picking has been a long-time dream of warehousemen. Thanks to a system engineered by Walter Kidde Constructors Inc., New York, and put together by Link-Belt Co. at its Colmar, Pa. plant, the dream is about to come true.

Bulk picking involves a breaking down of orders into individual items, systematically picking all order quantities from each bin and then reassembling finished orders for shipment. Without the help of electronics and automatic handling devices, the confusion of such a system outweighs the advantages.

It Works—With the experience gained on the Link-Belt installation to guide them, Kidde engineers have surveyed several other warehouses. On a particular day, one had calls for 6900 of a total 9100 items. Some 35,000 visits to reserve stock areas, picking racks and bins involved over 1 million ft of travel by pickers. The automated system would have handled the identical orders with 7000 picks while traveling 10,000 ft.

Other savings include: As much as 50 per cent reduction in labor costs, about 25 per cent reduction in warehouse space, better inventory control, quicker loading and unloading of trucks and substantial reduction in breakage, returns, pilferage, etc.



LIKE REVOLUTIONARY COST CUTTING PRESSES

that operate with near-human dexterity, super-human accuracy, speed and endurance and minimum human effort and attention to produce better products faster and more economically . . .



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. . . top parts yield per ton . . . more feet per coil . . . fewer production interruptions for coil replacement on automatic feed operations.

. . . less wear on dies . . . fewer die changes and "regrinds."

. . . easier fitting and assembly . . . fewer "oversize" rejects . . . less tedious "resizing" to make oversize parts fit.

More important . . . in many cases, CMP Cold Rolled Strip Steel can be processed to restricted physical specifications to facilitate, consolidate or even eliminate labor-consuming production operations and handling. Often, a simple specification change can do as much or more to reduce manual costs than expensive new equipment.

A qualified CMP representative will be pleased to check your flat-rolled material specifications and fabricating processes with a view to developing restricted specifications that will cut your end-product costs.



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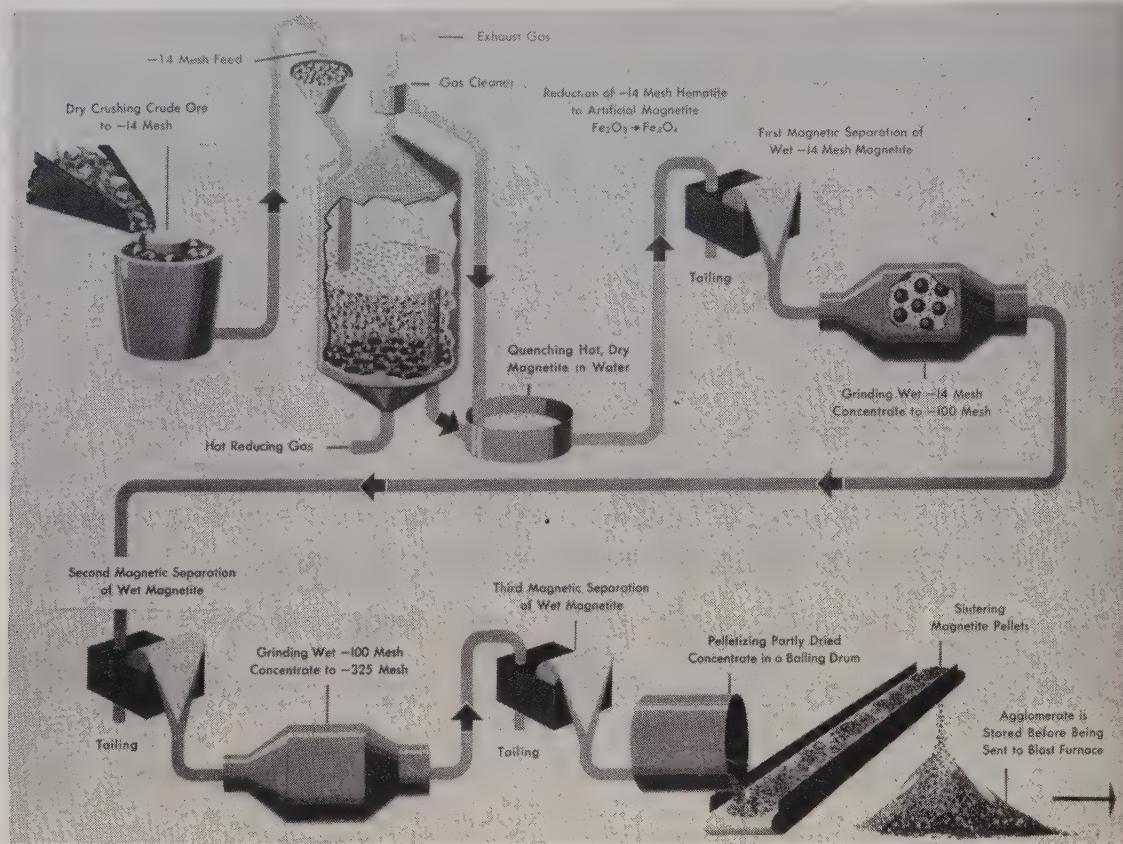
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PROGRESS IN STEELMAKING

This process turns nonmagnetic taconite into . . .



Another Source of Blast Furnace Ore

STEELMEN have come up with another trick for putting the much-publicized taconite ores to work for them. This time it involves the tremendous tonnages of Michigan hematites that are intermixed with hard, siliceous rock.

Up to now, most of the work in taconites has been with the magnetite ores of Minnesota that lend themselves so readily to magnetic separation after they've been crushed. Now researchers at Jones & Laughlin Steel Corp.'s ore research laboratory at Negaunee, Mich., can turn nonmagnetic hematite into artificial magnetite on a commercial basis.

Here's How—While proved on a pilot plant operation at the lab, plans call for development of full-scale commercial plants capable of delivering high-grade concentrate to J&L blast furnaces in Pittsburgh, Aliquippa, Pa., and Cleveland. The heart of the system is a new type of fluidized solids reactor which has been used previously for roasting sulphide ores. The operation is on

much the same principle as catalytic cracking reactors used by petroleum refiners.

Nonmagnetic Michigan taconite, ground to minus-14-mesh particle size, is chemically reduced to magnetite while suspended in a turbulent stream of hot reducing gas. Accurate temperature control and uniformity of reaction are maintained by the intimate contact of gas with the taconite particles in turbulent motion.

Shock Cooling—After leaving the furnace, the hot ore is quenched in water. This shock-cooling produces cracks in the ore which facilitate fine grinding and better separation of iron mineral from the silica after grinding.

Following three successive stages of grinding and magnetic separation, the ore is concentrated to a high-grade fraction containing as much as 63-per-cent iron. About half the original ore is eliminated as a high silica waste product.

Three Stages—In the first concentration step, the minus-14-mesh

ore enters a wet magnetic separator where about 20 per cent of the material is discarded as tailings.

In the second step, the rough concentrate from the previous operation is ground to minus-100 mesh, then subjected to a second magnetic separation. Here another 20 per cent of the original crude ore is rejected as tailings.

Finally, in the third operation, the concentrate remaining (now about 60 per cent of the original feed) is further ground to minus-325 mesh and again treated magnetically to eliminate further the waste material.

Dewatering—After completion of the concentration steps, the water is removed in thickening tanks and by drum filters which extract water by means of vacuum pumps.

To prepare a suitably coarse feed for sintering, J&L has applied pelletizing as the initial agglomeration process. A rotary drum forms the concentrate into balls or pellets which are then hardened on the sintering machine's moving grate.

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It's profitable for you to use this air-setting refractory mortar to bond all types of fire brick and insulating refractories at temperatures to 2900° F. By standardizing on Armstrong C199 Cement, you can buy in economical quantities, simplify inventory, and be sure of a strong, dependable job every time.

For a free booklet on C199 Cement and the complete line of Armstrong Insulating Fire Brick, write Armstrong Cork Company, 2704 Reed Avenue, Lancaster, Pa. If you have any questions involving the use of Armstrong Insulating Refractory Products, a sales engineer in the nearest Armstrong office will be glad to help you.



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Considerable machining is required in the manufacture of parts for these taps. That's why Crucible MAX-EL® 3½ free machining alloy steel was chosen by the Geometric Tool Company, Division of Greenfield Tap and Die Corporation. For with MAX-EL you can rough machine, then heat treat even intricate parts before final machining with no danger of distortion of the steel.

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For complete data . . . and quick delivery of MAX-EL alloy steels call Crucible.

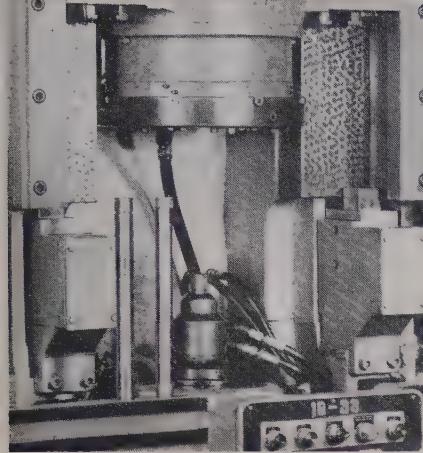
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CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.



Gear shaper modified for . . .

Spline Machining

A BUILDER of automotive transmissions is machining splines on both ends of a hollow shaft (14 in. long) at production rates of 240 and 300 parts an hour. The 28-tooth, 24-pitch splines have a face width of $\frac{7}{8}$ -in. on one end and $1\frac{1}{4}$ in. on the other.

Work is done on a gear shaper made by Michigan Tool Co., Detroit, which has a work capacity up to 3 in. in diameter and face width. But throat clearance on the standard machine provides for work up to 10 in. in length.

Modification—To provide for the additional throat clearance, the manufacturer increased the height of the main column casting on the machine and mounted a longer-stroke hydraulic piston.

Other special fixtures include a safety lock, to insure maximum throat clearance while loading and unloading the work, and a hydraulically actuated, wedge-type, automatic-clamping fixture with safety interlock which permits machine operation only when the proper end of the hollow transmission shaft is in cutting position.

Production Rate—Cutting cycle time for the $\frac{7}{8}$ -in. face width spline is 12 seconds. The $\frac{1}{4}$ -in. spline requires 15 seconds.

Changeover from shaping splines on one end of the shaft to the other requires about 15 minutes. It involves changing the bottom stop on the fixture for correct height, replacing change gears to give correct cutting speed and adjusting the stroke of the reciprocating work fixture to conform with the spline being cut.



Directors' Meeting ...THE MORNING AFTER

In the middle of the night fire hit this plant with sudden, blasting fury. Started in oil storage and spread like lightning. Next morning the directors could rightfully ask, "Where was our protection?"

Unfortunately, it lay in a desk drawer—a proposal for a fire extinguishing system that would have made oil storage and half a dozen other equally bad hazards fire-safe. Procrastination pigeonholed protection . . . and disaster didn't wait!

In most plants there are critical hazards for which generalized fire protection may be hopelessly inadequate. It was for just such "hot spots" that CARDOX years ago originated "Low Pressure Carbon Dioxide Systems"*. Applying CARDOX CO₂ as readily in tons as in pounds, these Systems stop fires unbelievably fast . . . without any extinguishment damage whatsoever. They have saved industry many millions of dollars.

Why not ask CARDOX to survey and give you a report on your danger spots? There's no cost or obligation.

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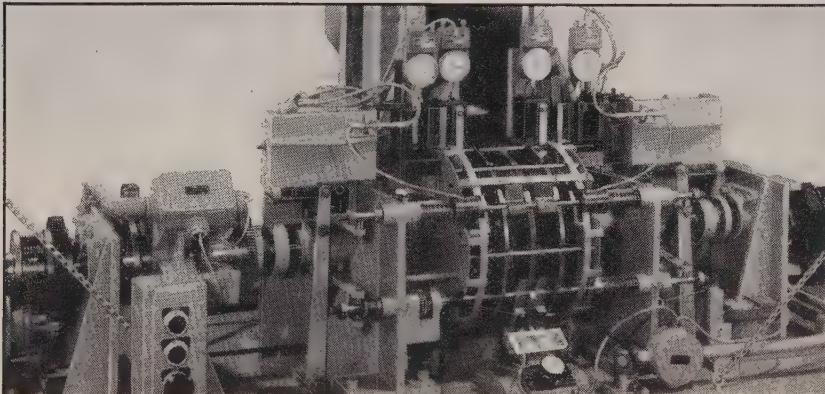
CARDOX
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YES, IT'S EASY TO MAKE WORK DIMENSIONS CONTROL THEMSELVES.

Hundreds of firms now use Federal Electricator and Electronic Gages to do the job. In contact with work in process, they feed back dimensional information to control machine feeds and speeds, operate signals and stop operations at the end of cycles or when the machine needs major adjustments. Successful applications include various grinding and lapping operations, production of continuous materials and other machine processing operations.



AUTOMATIC 100% IN-PROCESS INSPECTION IS EASY, TOO. Here, a Federal Electronic Gage inspects finished push rods for diameter at each end, presence of oil hole in each end, hardness of each end, overall length and straightness. Gages such as these are set right in the production line. Workpieces are carried automatically from one operation to the gage. Acceptable pieces are passed on to the next operation and unsatisfactory work is rejected. Gages for several different inspections are alternated with the production machines as required.

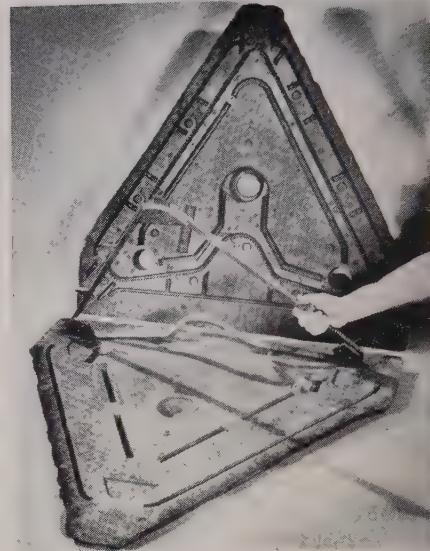
INVESTIGATE! Your nearby Federal sales engineer can give you up-to-the-minute information on automatic dimensional control or inspection gages. Maybe he'll tell you that Federal has already solved your gaging problem . . . that an existing Federal gage will eliminate costly, time-consuming engineering. In the meanwhile, write for our new bulletin, "Automatic In-Process Gaging". The information in it may save you hours of time and hundreds of dollars.

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Shell molds can produce . . .

Ready-To-Use Parts

INTRICATE iron distributor tracks for devices that spot bowling pins need no machining when cast in shell molds.

Builders Iron Foundry, Providence, R. I., uses fine-grained sand bonded by resins to provide the necessary rigidity to the thin, flat, triangular shell molds with sides nearly a yard long.

Ready-To-Use — Cast to tolerances of ± 0.008 in., with the desired surface finish and casting flatness, the distributor tracks are ready after cleaning in the foundryroom.

In addition to eliminating finishing operations, use of these shells, made with Bakelite phenolic resins, cuts production costs by reducing the number of scrap castings.



Track for automatic pinspotter made by American Machine & Foundry Co.



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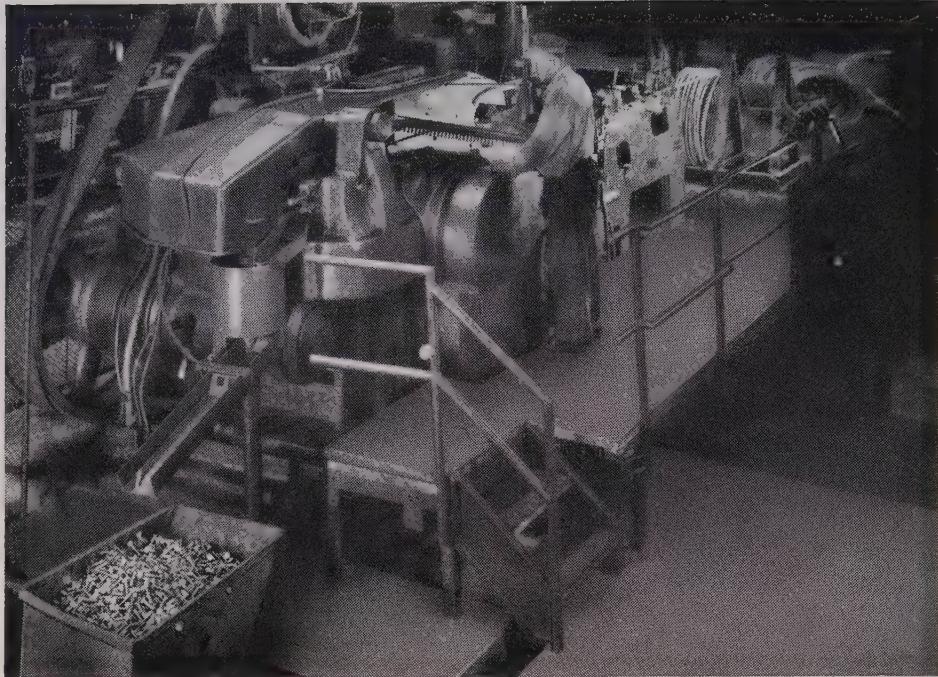
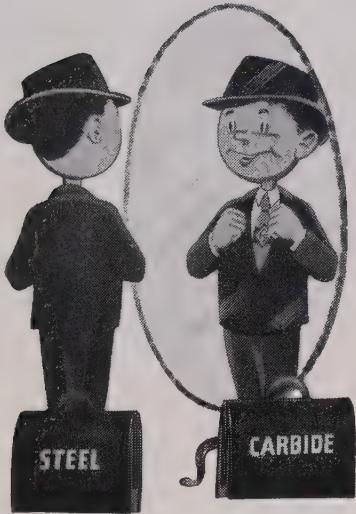


Photo shows automatic bolt maker. Courtesy of Oliver Iron & Steel Corporation.

Mr. Tooley Says:

"It takes two to make a bargain"

How right!

In the field of tools and tooling materials for shaping, forming and removal of metal, Firth Sterling occupies the unique position of supplying *both* steels and carbides to do your job. Thus you are always assured of a *bargain* . . . the just-right selection from alternative materials, offered *without bias* from a single source of complete shop tooling.

Cold heading operations, for example, illustrate the point. Either steel or carbide, or both, may be used successfully. But one may have an advantage over the other because of the requirements of the job . . . such factors as quantity of product, geometric design, desired finish, material used and tolerances required. We have *both* steel and carbide. We can recommend the exactly right one, or both, if indicated! Yes, for cold heading "it takes two to make a bargain" . . . Firth Sterling C.H.Q. Steel and Firthaloy Carbide Nibs.

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FIRTHALOY CARBIDE NIBS

- Controlled quality
- Made specifically for cold heading applications
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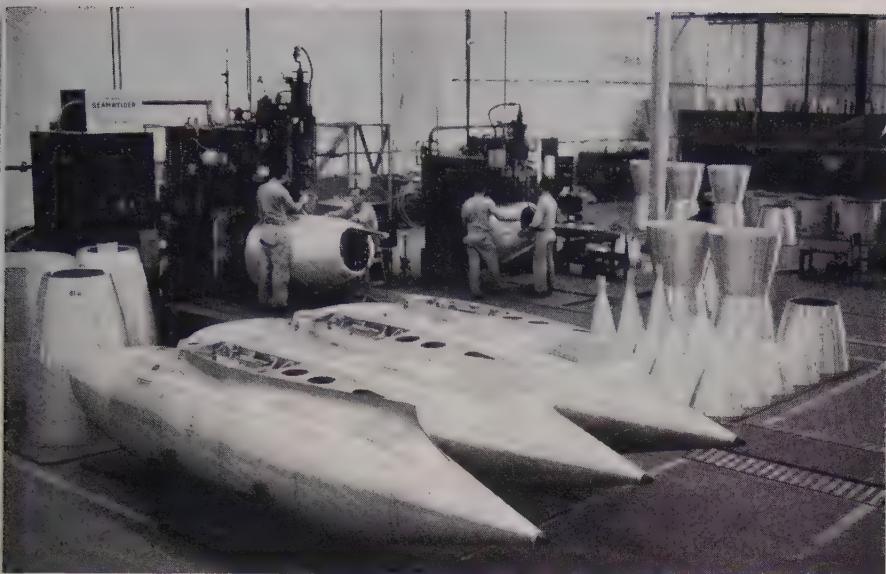
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FIRTH STERLING TRADE MARK



Finished fuel tanks in the foreground are strong, lightweight structures achieved through specialized spotwelding design



Tank splice rings are arc welded with inert-gas-shielded method. These are used to back up butt welded tank joints

Tight-Tolerance Aluminum Fabrication

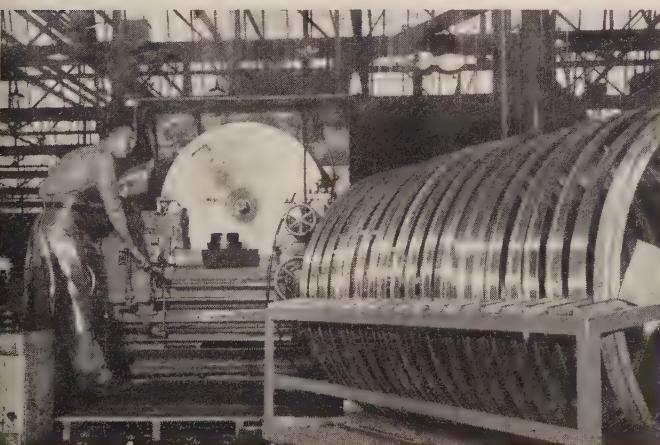
That's what the specs called for in building aircraft wing tanks. They're little more than skin welded to joining rings, but all parts are interchangeable and rugged

BIG as they are, the wing fuel tanks for the Air Force's KC 97 stratofreighter are constructed without a single longitudinal stress member. How Ryan Aeronautical builds them that way is a story of design and fabrication ingenuity. The object was to make the

tanks strong enough to meet terrific service requirements yet simple and light in structure. But eliminating such things as quarter-section stampings meant designing larger sections. Tiny errors magnify themselves in big components, so forming had to be

precise. Another drawback: Less space in which to weld is available.

Five Sections—The finished tank consists of a spun 61S aluminum nose dome and tail cone, each of which is lengthened with a welded 61S sheet section. They make up



Precision machined aluminum alloy rings are used to bolt tank sections together at break-away joints

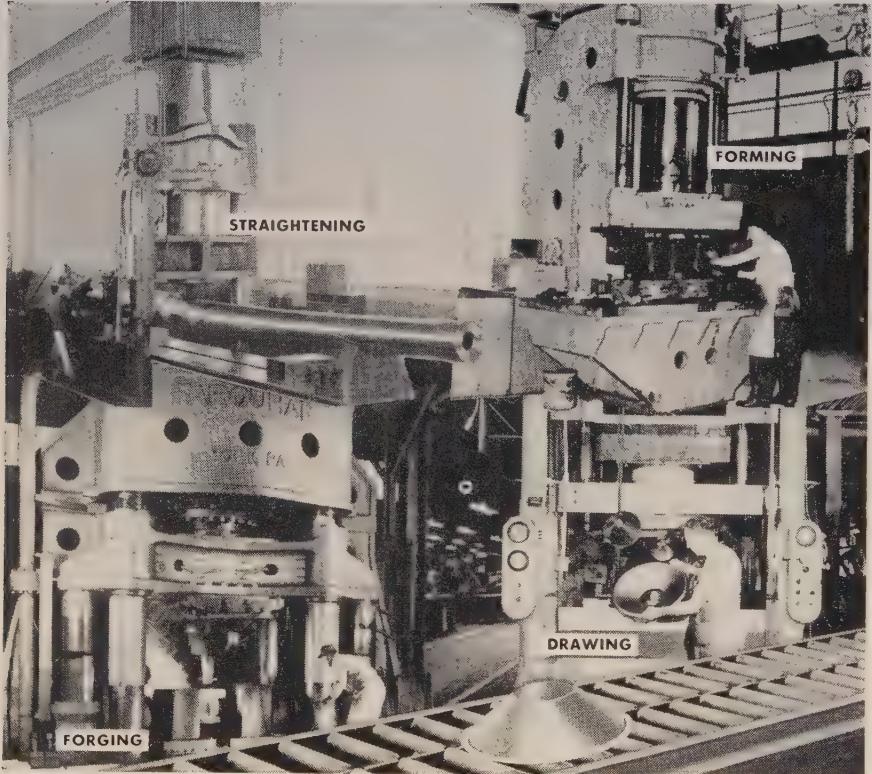


Pressure tests of the spotwelded, gas-tight components are made on this special fixture

Farquhar

HYDRAULIC PRESSES

Eliminate Metal Cutting



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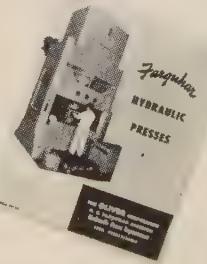
CHIP MAKING IS COSTLY

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A. B. FARQUHAR DIVISION

THE OLIVER CORPORATION, 1522 Duke St., York, Pa.

the two fuel-carrying compartments. A welded sheet center section joins the two.

First, the 61S is rolled into circular sections, slightly undersize in diameter, and the longitudinal seams are welded on Heliarc machines. Sections are next heat treated in an elevator-type electric furnace which brings them up to 980°F and quickly cools them in a cold water spray. Components are then stretched to exact diameter on expanding mandrels. Tapers also can be formed on this machine. Accuracies to 0.025 in. diameter can be obtained readily. Sections are then aged for 8 hours at 350°F to raise ultimate strengths to the specified operational levels.

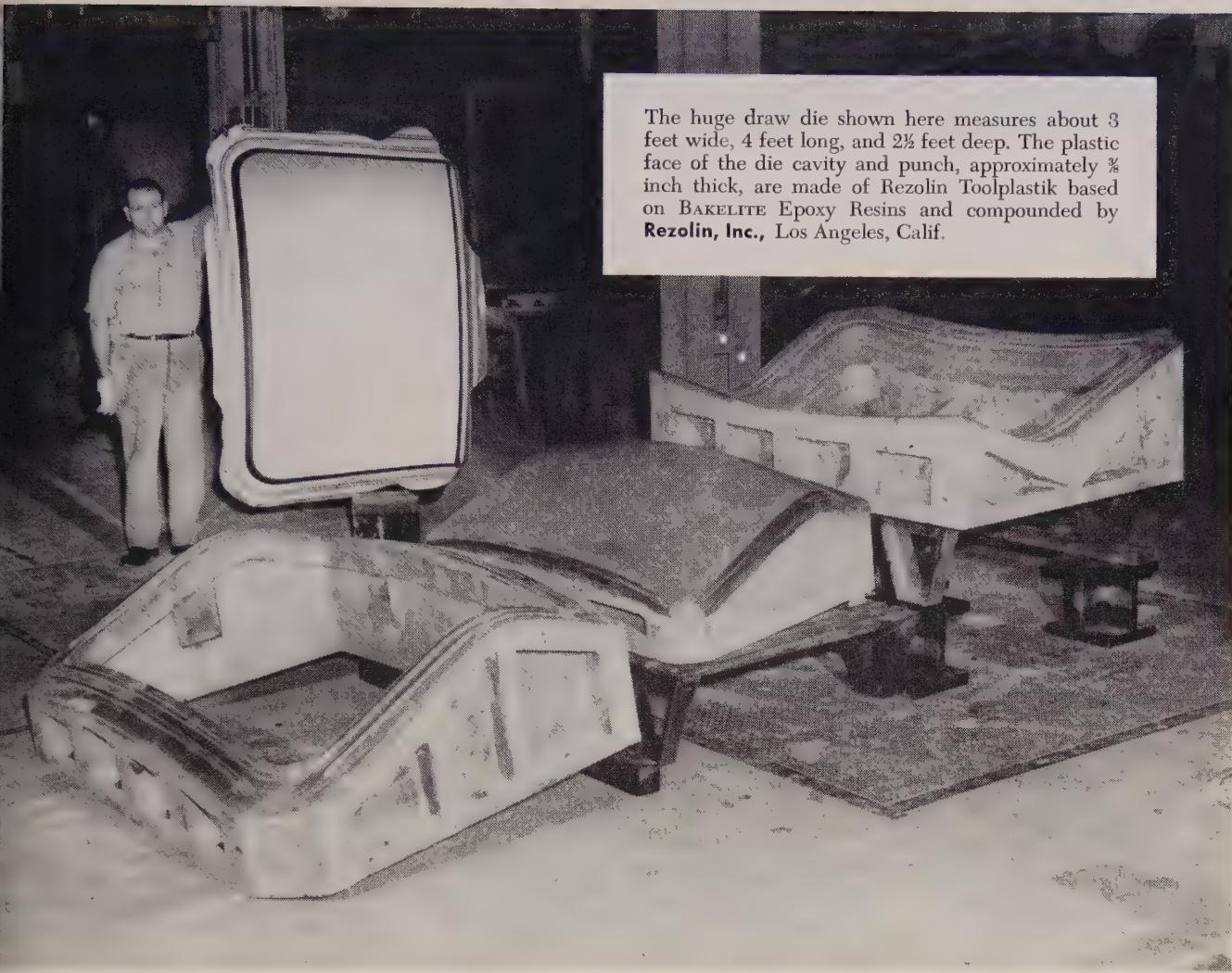
Trimmed and Welded — Tank sections are trimmed by high-speed routers to 0.010 in. accuracies. During this operation sections are held on a rotating drum by air-filled tubes which expand against the inside of the parts. Filler caps and other openings are blanked out in a press and the components are ready to be spotwelded.

Eight giant machines, capable of 200 spotwelds per minute and exerting 11,000 lb of electrode force, have electrode arms 60 in. long and 62 in. above the floor. Circumferential welds join components to the splice rings, each joint getting two rows of roll spotwelds and two rows of seamwelds.

Testing—Each tank section is pressure tested to prove it gas-tight without use of sealers. While clamped between two rubber faces tanks are pumped with air to 4.5 psi.

When completed, the tank is suspended in the air and pressure tested again. This time 3.5 psi is held for 45 minutes. A sensitive manometer gage, sensitive to a pressure drop of only 1/500-lb pressure drop, checks for leaks during this period.

Tanks must also pass slosh tests while fully loaded. For 2½ hours they are rocked back and forth through a 30 degree angle 10 to 16 times per minute, while the structure is vibrated at a frequency of 90 per cent of normal crankshaft speed of the aircraft power plants.



The huge draw die shown here measures about 3 feet wide, 4 feet long, and 2½ feet deep. The plastic face of the die cavity and punch, approximately $\frac{1}{8}$ inch thick, are made of Rezolin Toolplastik based on BAKELITE Epoxy Resins and compounded by Rezolin, Inc., Los Angeles, Calif.

25% LESS COST—40% LESS TIME TO FACE THIS DIE WITH EPOXY RESINS

Rezolin" tooling compounds, based on BAKELITE Brand Epoxy Resins, are liquid materials. Thus a simple casting operation formed this die face to the desired shape. By mixing the resin with liquid hardener before pouring, it was cured at room temperature without applied heat or pressure. Shrinkage was so slight that finishing operations were kept to a minimum.

When cured, the epoxy resin compound is hard and tough, with excellent impact, compression, and flexural strengths. The face of this die is only $\frac{1}{8}$ in. thick, yet it stamps sheet steel into auto trunk lids. If design changes are needed, the surface can be readily ma-

chined or patched to fit new contours.

Jigs, spotting racks, checking fixtures, and Keller models are examples of other metalworking tools made with these compounds—usually by laminating with glass cloth. This construction results in excellent dimensional stability and accuracy. Tools are lighter and easier to handle than when made of conventional materials. They are strong and durable because of the hardness of BAKELITE Epoxy Resins when cured.

You'll benefit from the advantages of tooling with BAKELITE Epoxy Resins when speed is important . . . where model changes are frequent . . . when modifications in design are a factor . . .

where a large variety of models demands a number of tools in a hurry. Take your first step toward efficient, up-to-date tooling with compounds based on BAKELITE Epoxy Resins.



BAKELITE COMPANY, A Division of Union Carbide and Carbon Corporation UCC 30 East 42nd Street, New York 17, N. Y.

In Canada: Bakelite Company, Division of Union Carbide Canada Limited, Belleville, Ontario

The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC

Assembling control handles for do-it-yourself tool by . . .

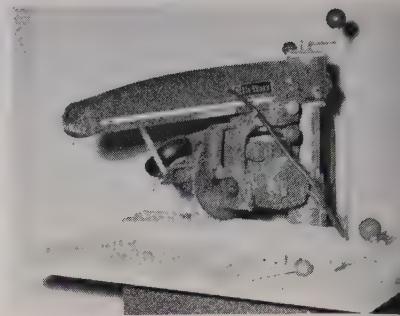
Stud Welding Simplifies Job

STUD WELDING at DeWalt Inc., Lancaster, Pa., saves the company 50 per cent in the cost of assembling three control levers on its Power Shop, a multipurpose, wood-working tool.

A standard Nelson stud welding gun does the job. It is mounted

vertically on a yoke fixture which is bolted to a table. Special holding fixtures position the studs and other components. An air cylinder positions the gun for welding.

This method requires only one man. The former took several—for hand welding, hand grinding and



machining parts.

Forming Handles—The Power Shop is basically a radial-arm saw with the motor pivoted in a universal yoke. The handle, which raises or lowers the radial arm on its column, is formed by welding a $\frac{3}{8}$ -in. bent stud to a round collar.

Similarly, a straight $\frac{3}{8}$ -in. stud is welded to a hexagonal collar, forming the handle which locks or releases the motor yoke at any point of its 360-degree swivel.

The third control is the rip lock, a $\frac{3}{8} \times 2$ -in. stud with national fine threads and rivet end, which is welded to a knurled handle. When turned against the machine arm, it holds the yoke in place at any point of travel along the arm.

Convenience—Operational efficiency is further increased by bringing bins of studs and other components to the table, where they are within easy reach of the operator. After welding, assemblies are placed in a caster-mounted truck, also close at hand.

This stud-welding setup not only saves the company money, but simplifies operation and improves the appearance of the product.

Operator reaches for hexagonal collar to assemble yoke clamp handle with stud welding setup

An advertisement for Formed Tubes, Inc. The background features several complex metal tube assemblies, likely exhaust and tailpipe components. In the center, there is a large circular graphic containing text. The main headline reads "Exhausts and Tailpipes". Below it, in a bold, sans-serif font, is "...our Bread and Butter!". Underneath that, in a smaller bold font, is "any kind of tube fabricating, our dish!". At the bottom of the circle, the company name "FORMED TUBES, Inc." is written in a bold, serif font. Below the company name, the address "404 Prairie, Sturgis, Mich." and phone number "Phone 681" are listed. The overall design is industrial and focused on metal fabrication.



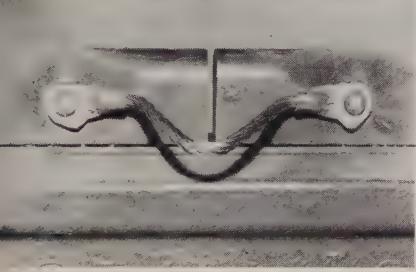
BONDING SIGNAL CABLES to rails may not be your problem, but an electric-arc brazing technique worked out for railroads may be applicable to your operation.

With this method, called Tigerbraze, a crewman can braze a 5-in., flexible bronze cable to rail ends in less than a minute. The secret is a special knock-off pin with a silver solder cap. This pin serves as a solder applicator and also holds the bonding cable in place.

Old Way—Railbonds are usually attached to rails by pins driven into drilled holes. This is unsatisfactory because vibration shakes the



A 1-second flash (above) and in less than a minute both lugs are brazed to the rail joint (below)



pins loose. The cables cannot be welded because the high and prolonged temperatures cause embrittlement of the rail and the bond.

With electric-arc brazing, using a stud-welding gun, intensity of the arc is sufficient to form the braze but will not cause brittleness in the rail.

Equipment — Tigerbraze equipment includes the welding gun, batteries and a small, gasoline-driven battery charger mounted on a cart which rides on the rails or retractable rubber wheels. Railbonds are bronze cable, with copper lugs on each end. In applying the bond, a ceramic collar is used to shield the arc and concentrate the heat.

Rails first are ground to provide a good contact surface. The pin is seated in the gun and the solder end inserted through the hole in the bond lug, making contact with the rail behind it. The collar fits

A new technique uses a stud welding gun and special pin for . . .

Flash Brazing Rail Signal Bonds

over the pin, between the gun and the lug. Depressing the gun's trigger sends 200 amp at 36 v through the solder. As the current ceases, the steel pin plunges into the melted solder, squeezing it between the lug and the rail. The pin is easily broken at a notched area just below the solder cap.

Tigerbraze is the result of three years of research by U. S. Steel's American Steel & Wire Division, Cleveland; Nelson Stud Welding, Lorain, O.; and AGA (Svenska Ab Gasaccumulator) Stockholm, Sweden. The bonds, installation cart and equipment are merchandised by American Steel & Wire.

CUT YOUR COSTS . . .

WHERE YOU CUT YOUR MATERIALS



"He must have got hold of an ALLISON WHEEL!"

Many production managers have been happily surprised at the immediate jump in production when they switched to Allison Abrasive Cut-Off Wheels. This is evident not only in the increased number of pieces per hour, but also in the increased cuts per wheel and the higher quality of the work. The pay-off is more pieces per hour at a lower cost per piece.

There is an Allison Wheel to fit almost every job; cut almost every material. If you have a wet or dry abrasive cutting problem, ask Allison first.

the **best** way to cut many materials . . .

the **only** way to cut some.

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ABRASIVE CUTTING WHEELS

OTHER IMPORTANT ALLISON PRODUCTS

MASONRY ABRASIVE CUTTING BLADES

Ask for further information about Allison's complete line of wet or dry masonry cutting blades.



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WHEELS of PROGRESS



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Branch Offices and Warehouses — Bristol, Conn.
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Pittsburgh, Pa.

Distributors — All principal cities
In Canada: Bay State Abrasive Products Co. (Canada)
Ltd., Brantford, Ont.

WITH 1" SPEC"...

3 METALS!



It took BAY STATE segments *and* engineering to lick this problem for a New England manufacturer! Distributor abrasive engineer Jack Somers did it, and gave the customer *extra* values too.

Here's how this problem was solved

Gear blanks, timing gear cases, transmission housings and other products . . . some of steel (both hardened and soft), some of aluminum, and others of cast iron . . . all had to be faced on rotating-table surface grinders. Obviously, savings could be made if the same set of segments could satisfactorily grind and finish all three metals.

Mr. Somers, using his specialized technical knowledge, proved it *could* be done . . . with the BAY STATE 8A-301G8-V2 specification.

Results: Cutting Action: EXCELLENT, on all three metals.

Segment Life: MORE THAN DOUBLE that of competitive specifications.

An *extra* value was the low cost of the "8A" abrasive, BAY STATE'S economy abrasive mixture which gives premium cutting characteristics at non-premium price.

Bay State can solve your grinding problems



Request BAY STATE'S free, "On-The-Job" engineering service (see coupon below), available through your local distributor, our district offices, or from Westboro.

This top-flight engineering service plus all the BAY STATE product superiorities, such as Fractional Grades (3 degrees of hardness within a single normal grade), Controlled Porosity, and the economy abrasive "8A" can bring about the solution to your grinding problems.

MAIL COUPON TODAY



Please send us Surface Grinding literature.

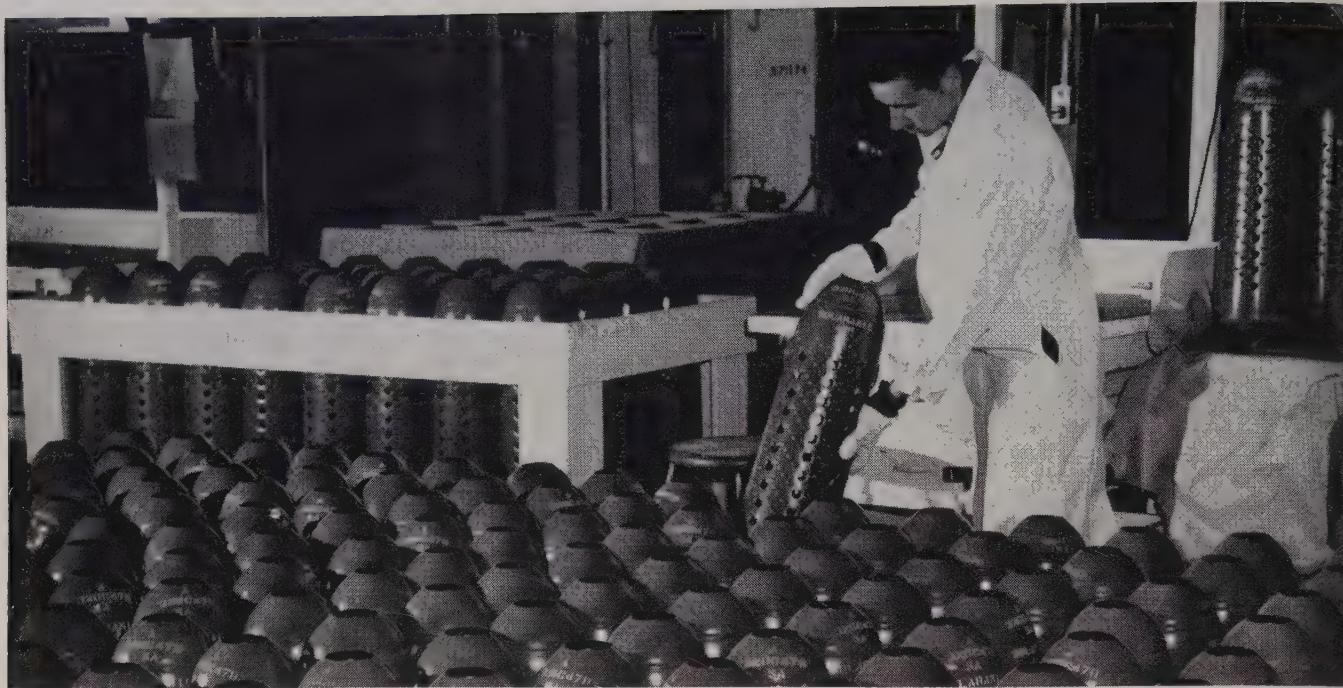
We have a grinding problem. Please have a representative call.

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COMPANY _____

ADDRESS _____

CITY _____ STATE _____



Defects here mean short life. Quality control is . . .

Insurance for High Temperature Coatings

Solar Aircraft Co.'s control system for applying ceramic coating assures uniform coverage and dimensional requirements. Here's how they do it

By E. S. BARNHART
Manager, Quality Control Division
Solar Aircraft Co.
San Diego, Calif.

CERAMIC COATING of parts subject to continual heating can involve a lot of headaches when you're new in a new field. That's what engineers at Solar Aircraft found when they tackled the job.

During the last two years a lot of ground has been covered. Controls have been set up for the materials and process used. Methods for evaluation of the end product have come into the picture.

Operation Sequence—In applying ceramic coatings to metal parts Solar follows this sequence: Make the frit, mill frit into powder, mix milled material with vehicle (in most cases water), clean parts to prepare them for coating, apply coating, dry, fire, inspect.

Control starts with the materials. When frit is purchased from outside vendors, the company requires a certificate of conformance. From each lot of 100 lb

made by Solar a 5-lb sample is submitted to the laboratory for testing. Three, 3 in. square by 0.043 in. thick material test coupons are run in the furnace with production parts and then subjected to mechanical and thermo-shock tests. The coupons are also inspected for appearance and thermo protection.

Batch Control—The mill batch is tested similarly. It must be ground so that 1 ml sample of the slip will pass through a 325-mesh screen, leaving a maximum 0.1 gram of residual by dry weight. It must have a specific gravity of 1.60 to 2 and pass an Erwin slump test for proper mobility of slip. Again three test coupons are prepared and fired in the front, center and rear of the furnace, then subjected to mechanical and thermo-shock tests.

First step in process control is

to be certain proper equipment and materials are used for preparing the parts. Standard automatic and semiautomatic sandblasting cabinets are used only for preparing parts for ceramic coating, thus avoiding contamination. Frequent checks are made on grain size and the sand replaced as required.

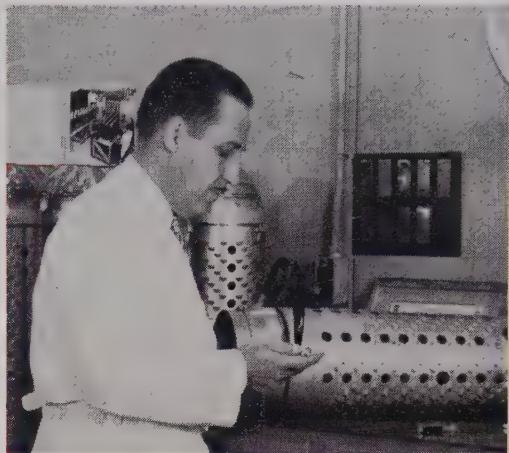
Blasting Watched—Blasting pressures are carefully controlled and care is exercised to avoid directing the nozzle at one place for a long period.

For some parts, etching by chemical process has advantages over the use of sandblast. In these cases exacting controls on the chemical solutions, time and temperature are exercised.

Furnace Check—Firing furnaces are equipped with recording pyrometers. Once a month the furnace and recorder are checked

Defects sometimes occur in the ceramic coating. Here's how Solar treats them:

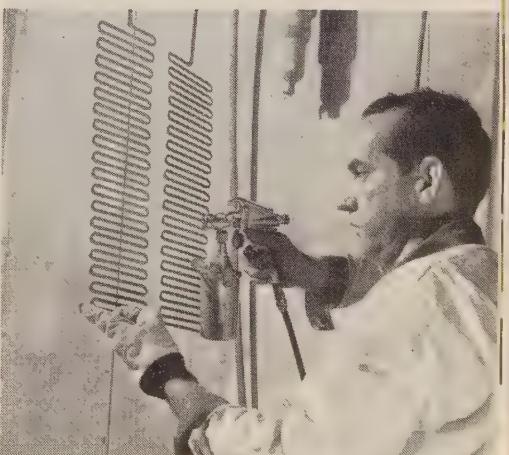
1. Any area up to $\frac{1}{8}$ -in. square where the coating has come off down to the base metal is acceptable if there is no more than one of these areas in any 3 square inches.
2. Complete coverage is required on edges of all holes, thimbles, louvres and eyelets, with practical limitations. If the hole is not in the direct path of excessive heat, complete coverage becomes a minor consideration.
3. Continuous coating to within $\frac{1}{16}$ -in. of edges formed by overlap of two surfaces is acceptable if the discontinuity at the edges does not exceed 50 per cent of the linear length of the edge.
4. Scratches or other surface defects, where the base metal is not exposed, are acceptable if they do not exceed $\frac{1}{8}$ -in. square in size.
5. Coating build-up on edges, if not governed by dimensional tolerances, is acceptable if it does not exceed 0.005 in. and is present on one side of the edge only.
6. Parts having a brownish tint, which often occurs if they are fired a second time, are acceptable if the color is uniform.
7. Spalling is acceptable, providing it is not over 1 sq in. in area, does not penetrate to the base metal, or occur in more than three places in any one part.
8. Excessive crawling, a condition of sags and runs, is not acceptable, and indicates parts have been too heavily coated.
9. Small brown specks, called copperheading, is an acceptable condition if it is not excessive and is in an isolated area.
10. Coatings can be repaired by completely removing and recoating once only. Spot repairs are allowable, providing not more than three such repairs are made on any one part.



Inspector calipers uncoated jet engine combustion chamber liner. Dimension checks must be made before and after ceramic coating is applied to assure that distortion does not put the part beyond tolerances



Ceramic coated parts like this turbo-supercharger nozzle box are checked to see if all areas are covered with a coating of proper thickness



Ceramic coatings have civilian uses, too. Here high nickel alloy electric heating elements are coated to protect them from the destructive effects of 1700°F in carburizing furnace service

with an optical pyrometer. Thermocouples are used for a more thorough check. Furnace atmosphere is checked with a gas analyzer.

Certain holding fixtures are used to maintain dimensions during the firing cycle. They are inspected frequently for flatness, size, etc. These must be kept in good shape to avoid distortion of parts.

Parts Inspection—Proper cleaning is a must for good bonding of the ceramic coating. All parts are degreased, in some cases acid pickled, and then sandblasted. If not immediately sprayed or dipped with coating, parts are protected from contamination by wrapping paper.

A daily mill batch report is the inspection record of parts processed. As in the case of the mill batch, standard coupons are run

with production parts. These samples, too, are subjected to mechanical and thermo-shock tests. If the coupons fail the test, the lots of material, with which they have been run, will be withheld. In extreme cases they will be stripped and recoated. Stripping and recoating can be performed once on most parts produced.

Final control is the inspection of a completed part for ceramic defects and dimensional requirements. Experience and knowledge of application here plays an important part. Only with this know-how can an inspector determine whether there is a defect and whether it is acceptable.

Rejection of a part for a minor defect would require a spot or a complete repair. In many cases this can be more detrimental to the service life of the part than accepting the defect as is.

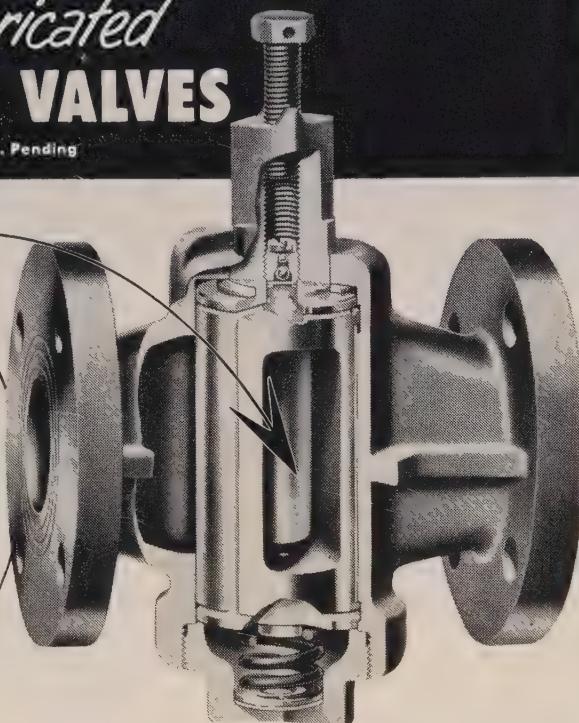
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8. Triple head-seal with Lubricant and Teflon packing ring.
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CORAOPOLIS, PA.

Tooling setup makes this a ...

Dual-Role Press

EQUIPPING a utility press with a pull-down attachment and a dual-function fixture enables it to broach and stamp crankshaft sprockets for a large automobile manufacturer at a rate of 280 parts an hour.

This machine stamps a timing mark and broaches the internal keyways on two sprockets during one cycle.

How It Works—The operator loads sprockets on a ledge of the fixture with broaches in the down position, then returns the broaches through a hole in the part. He then shifts to broaching position and machines the keyways. Near the end of the stroke, pins on the guideways engage the cams on the stamping fixture which actuate the marking heads. These stamp timing marks on sprocket faces.

The utility press is made by Colonial Broach Co., Detroit.

Oxygen Steelmaking

Is this new technique destined to become the real volume producer?

STEEL devoted five pages on Apr. 4 to the description and evaluation of the process as it is carried out at Dominion Foundries & Steel Ltd. and McLouth Steel Corp. Extra copies of this article are still available in limited quantities from Reader Service, Penton Bldg., Cleveland 13, O.

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**because of
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The non-deforming, oil-hardening steel that combines ease of machining with low hardening temperature. Fine performance on blanking dies, punches, gauges, bushings, etc.

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5% chromium, air hardening with minimum distortion. Provides toughness and better wear resistance for thread rolling dies, forming and blanking dies, knurls, punches, gauges.

Ohio Die

High carbon, high chromium alloy, air hardening. Affords exceptional resistance to wear, with long life on trimming die, lamination die, shear blade, coining die, roll, mandrel and other difficult assignments.

Crocar

Air or oil hardening. A high carbon, high chromium steel, highly wear resistant; properly selected for lamination dies, wear plates, slitting cutters, forming dies.

Red Star Tungsten

Oil hardening. Unusual edge strength and wear resistance, with high hardness. Specify for taps, punches, spinning tools, slitters, blanking dies.

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LIGHT WEIGHT
1/2 ton model weighs
only 51 pounds.

SELF-ADJUSTING HEAVY DUTY BRAKE

OVERLOAD PROTECTION

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SEALED-IN LIFETIME LUBRICATION

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Lodestar is the first truly "heavy duty" version of the small electric hoist. It is built to serve you without costly maintenance or interruptions in your work schedules. The Lodestar is designed to serve you...not to be served.

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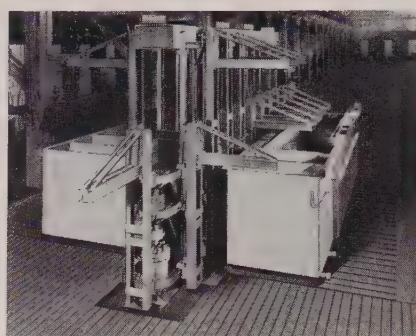
Write directly to the company for more information

Automatic, Heavy-Duty Plating and Processing Machine

The Stevadoer, designed for automatic loading and unloading, can be adapted to single or double-row plating and processing. It will handle nearly all rack sizes and weights. A delayed set-down mechanism (for independent timing in one or more tanks) and additional transfers can be provided. With a timer control, the carrier arm can be made to skip a particular tank or operation.

A 20-in., or wider, catwalk between processing tanks and the

mechanism on two-row machines permits safe and easy addition and removal of anodes or lubrication. All internal mechanisms are built below tank level; no moving mechanisms are over the solution. Controls permit independent adjustment of acceleration and transfer speeds to accommodate weight and rack size. Lift and horizontal motion is hydraulic. Frederic B. Stevens Inc., Detroit 15, Mich. Tashmo 5-0725



Multiple-Branch Tee Saves Header Problems

This tee, with extruded outlets, makes possible an economical solution to many header problems in the petroleum, chemical and power fields. It can be used advantageously in the fabrication of piping for air-conditioning and radiant-heating systems.

The tee conforms to the Code for Pressure Piping area replacement formula. It is especially useful where branch outlets are

appreciably smaller than the run pipe. The new pipe is tailored to individual jobs. Its size, wall thickness and the number and sizes of outlets are determined by individual service conditions. It is available in all commercial metals and alloys. Tube Turns, division, National Cylinder Gas Co., 224 E. Broadway, Louisville 1, Ky. Wabash 7551

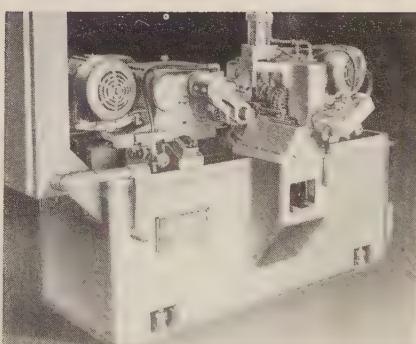


Duplex Mill Works Connecting Rods

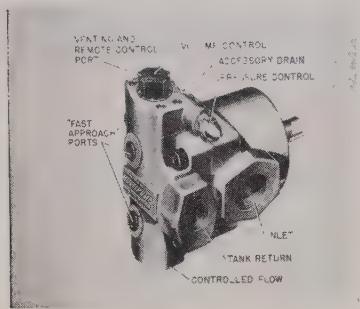
This machine cuts (by circular saw) the cap from the connecting rod at the crankshaft end. Simultaneously, both the top and bottom bolt seats are finish milled. The single arbor on each head has a Triple-Chip circular saw blade between straddle milling cutters, making simultaneous cutting and milling possible.

The machine consists of right and left-hand B-7½-traveling milling heads mounted on hardened

and ground steel ways. Each head has arbor supports for the saw blade and straddle milling cutters. The geared milling heads are driven by 5-hp motors. The electrical and hydraulic system is built to JIC standards. Part size and changeover are accomplished by using preset tool arbors and minor adjustment of the fixture locators. Motch & Merryweather Machinery Co., 888 E. 70th St., Cleveland 3, O. Main 1-1000



Variable Volume Vane Pump



The Multipump will deliver variable volumes at constant speed or constant volume at variable speeds. Advantages claimed are: Fingertip volume control which works independent of the compensator; a compensator control that works all volumes; and a pump which holds volume within ± 5 per cent over desired pressure and designed speed ranges. It delivers preset

volume and preset pressure to the system, gives the results of cylinder control by simply adding the on-off valve, and eliminates the need for servo control because it can be operated by simple push-pull cable.

The pump can be used where constant volume pumps are now used and a need exists for varying the volume, where piston or gear pumps are used for pressures up to 1000 psi continuously, where systems that call for high and low volume are served by double pumps and where volume must be held constant while changing pump speed. It is available in three sizes. Denison Engineering Co., Columbus, O. Hudson 8-1191

Cowles

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Anhydrous Sodium Orthosilicate

High-powered Cleaning at Low Cost

- Cowles DRYORTH is free-flowing, granular, dust-free. It contains not less than 60% Na₂O and is quickly and completely soluble.

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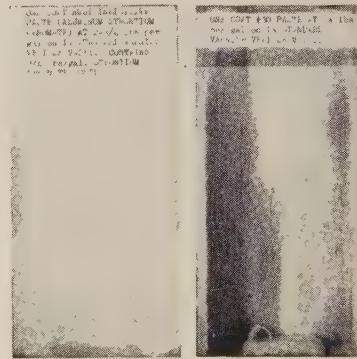
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- ★ heavy ferrous parts and castings

Try DRYORTH for these and other basic cleaning operations. DRYORTH — anhydrous sodium orthosilicate — assures long cleaning mileage at low cost.

*Reg. U. S. Pat. Off.

Cowles also manufactures a complete line of cleaners engineered to handle all kinds of cleaning problems on both ferrous and non-ferrous metals. The Cowles Technical Man in your area will be glad to discuss any metal cleaning problems you have. Write us today!

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300 GRT 400 PAINT - T + 10A
3 YEARS EXPOSURE 3-26-48

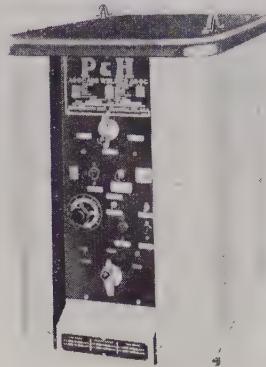
Thus, a paint made with this product provides the benefits of a rust-inhibitive primer and a reflective aluminum topcoat finish in a single coat. While this single coat is not claimed to be as good as a primer followed by a coat of aluminum, it is better than a single coat of either. Reynolds Metals Co., 2500 S. Third St., Louisville, Ky. Calhoun 4731

Two Versatile Welders

Models DA-200HF-GW (200 amp) and DA-300HF-GW (300 amp) are each adaptable to seven welding processes. They can be used for metallic arc welding, alternating or direct current, either straight or reverse. With the proper torch, they can be used for inert-gas welding, alternating or direct current; for automatic inert-gas welding; and for sigma

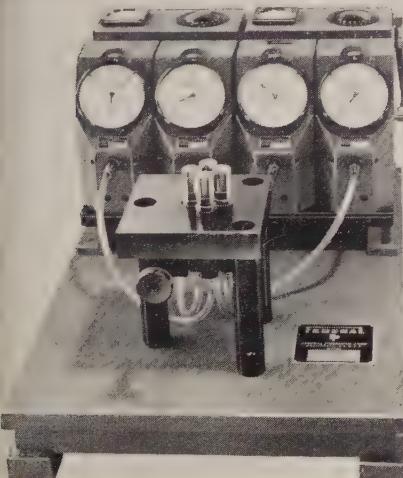
welding. Use of a spot welding gun adapts them for spot welding. P&H Dial-lectric control gives stepless heat adjustment.

The units have a built-in, automatic gas and water shutoffs for use with inert-gas processes. They are equipped with built-in, high-frequency units for use with alternating or direct current. Harnischfeger Corp., Milwaukee 46, Wis. Orchard 1-4400



Air Gage Checks Series of Holes Simultaneously

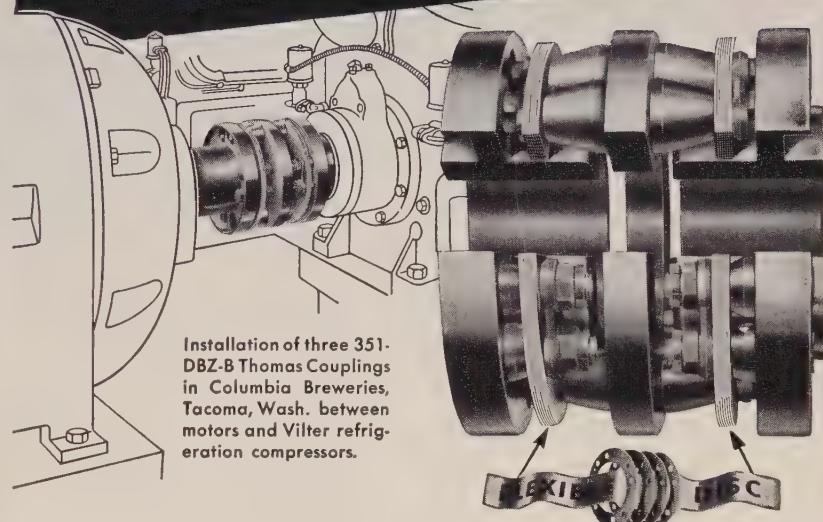
The illustrated gage inspects four holes in a nozzle plate simultaneously. The inspection consists of measuring the diameter of each hole and checking for roundness. The piece is placed on the platen, so that an air plug fits into each hole. The four Dimensionair (model A-167 B-1) dials are read to determine the hole diameters. If they are all O.K., a push rod (connected to all four plugs with a gear train to rotate the plugs) is



pushed in and out to make the roundness check. The dials are read from left to right as each hole is checked. This system eliminates the necessity of rotating the part itself. The push rod is moved in one direction to turn the plugs 180 degrees (it is pulled out to do the roundness check for one hole and pushed in for the next).

Federal Products Corp., 1144 Eddy St., Providence 1, R. I. Stuart 1-9300

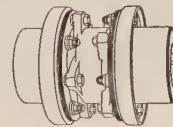
THOMAS FLEXIBLE COUPLINGS... for more years of better service!



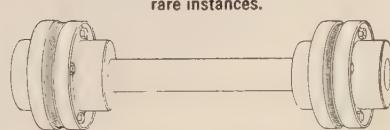
Installation of three 351-DBZ-B Thomas Couplings in Columbia Breweries, Tacoma, Wash., between motors and Vilter refrigeration compressors.

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

DISTINCTIVE ADVANTAGES	
FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention. Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts. Freedom from Shut-downs.
NO BACKLASH	No Loose Parts. All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment. No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling. Elastic Constant Does Not Change. Original Balance is Maintained.



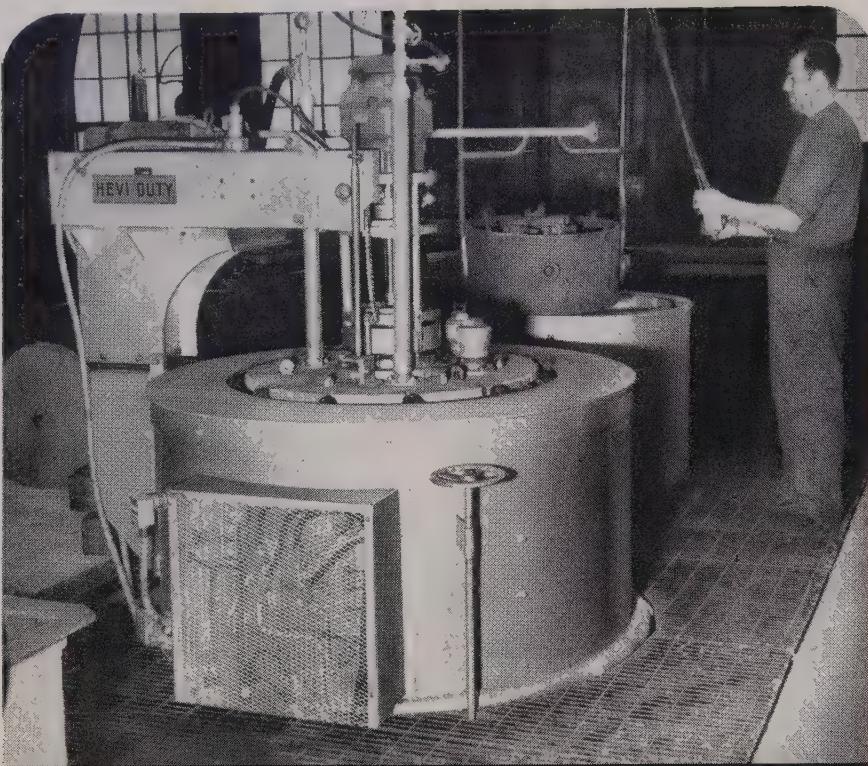
Thomas Couplings are made for a wide range of speeds, horsepower and shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.



Write for our new Engineering Catalog No. 51A



THOMAS FLEXIBLE COUPLING COMPANY
Largest Exclusive Coupling Manufacturer in the World
WARREN, PENNSYLVANIA, U.S.A.



CARBURIZING TIME CUT 4 HOURS with a **HEVI DUTY** FURNACE

Electrol Inc., manufacturers of hydraulic devices, carburizes landing gear orifice tubes in 3 hours instead of 7 hours formerly required by the pack method.

Edgar B. Roesch, Factory Manager, says, "With this Hevi Duty Retort Furnace, we can produce a more uniform case faster because —

Forced Circulation assures even case depth throughout the densest loads.

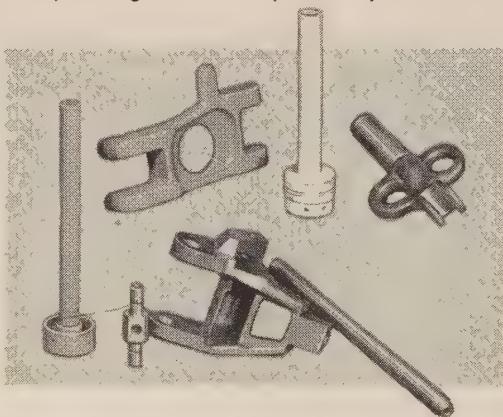
Zone Temperature Control helps bring the load up to temperature more quickly and evenly.

Positive Pressure inside the retort has simplified the obtaining of exact carbon concentrations on the surface of the work and to specified depths."

The carburizing atmosphere is supplied from a Hevi Duty Endothermic Generator to which natural gas is added.

This atmosphere protects the work from scaling which results in a further saving of 50% in surface finishing time.

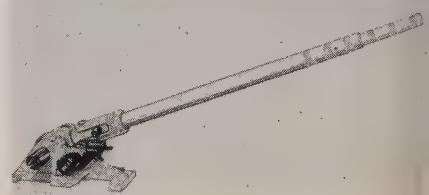
Write for Bulletin HD-646-R and more information about how the Hevi Duty Retort Furnace is used for carburizing, hardening, nitriding, and bright annealing.



HEVI DUTY ELECTRIC COMPANY
— MILWAUKEE 1, WISCONSIN —
Heat Treating Furnaces... Electric Exclusively
Dry Type Transformers Constant Current Regulators

Flat-Steel Strapping Stretcher

Model 48 accommodates 2 x 0.050-in., flat-steel strapping. It features: A frame gripper that locks in the open position and free wheeling of the tension drum for easier threading; a tension-handle repositioning device; a stretcher that is easily removed from the strap after completion of the tie. An extension handle adds leverage in tensioning. Long-lived parts and

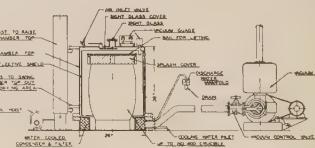


a four-faced gripper make for ease of maintenance.

In addition to the stretcher, Gerard also developed a 2 x 0.050-in. sealer (model 50). Its linkage system reduces operational effort and increases effectiveness. Gerard Steel Strapping Div., United States Steel Corp., 2915 W. 47th St., Chicago 32, Ill. Lafayette 3-1046

Vacuum Degassing Chamber

This equipment permits metal to be melted in present furnaces. It is then placed in the degassing chamber and subjected to a vacuum, to eliminate gas from the metal. It can then be poured into sand molds, permanent molds or ingots. During the short time the metal is again subject to air, it picks up a minor amount of gas.



Vacuum degassing is suited for aluminum and magnesium, pure copper and copper-base alloys. High-alloy steel and iron are also benefited by the process. Centrifugal Casting Machine Co., P.O. Box 947, Tulsa, Okla. Tulsa 2-2816

Cut Your Production Costs

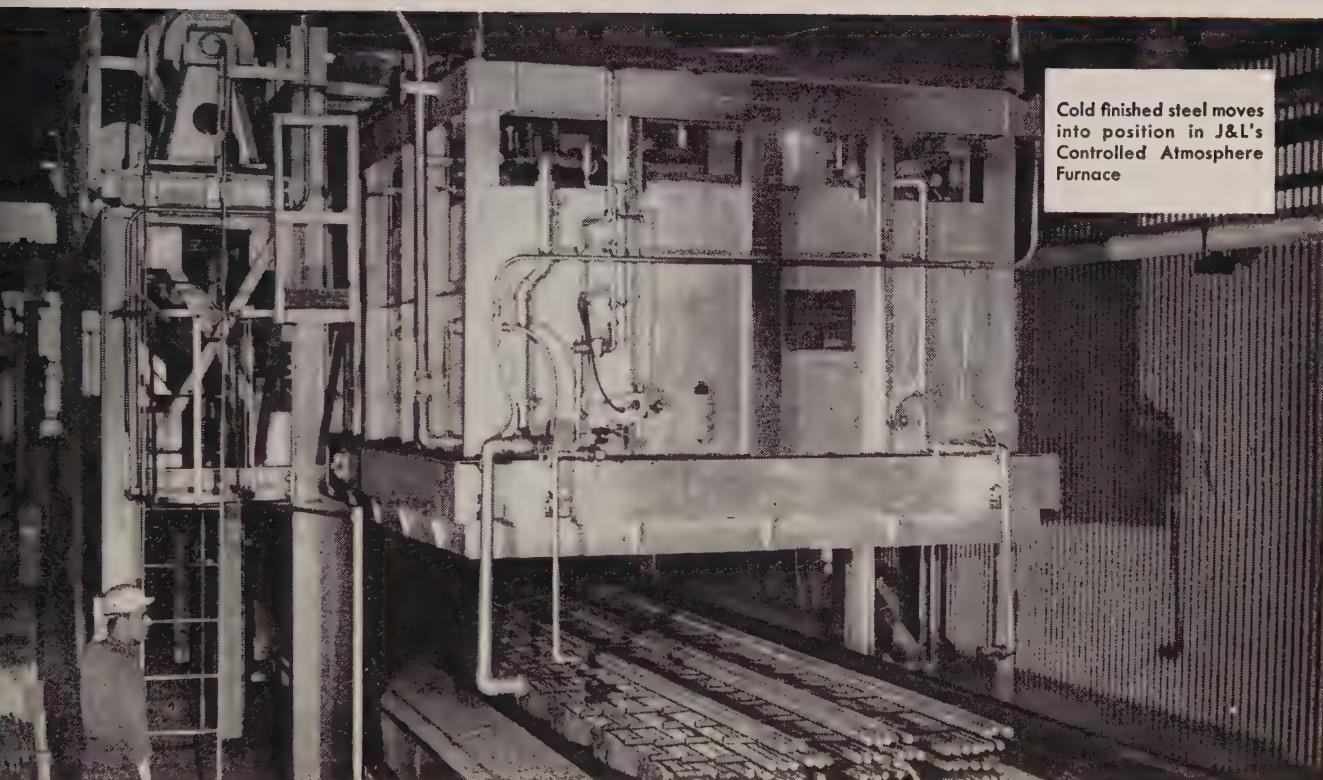
**whatever
treatment
you need:**

- bright annealing
- case carburizing
- normalizing
- stress relieving
- carbon restoration

**thermal
treatment
in prepared
atmosphere
furnace**

**saves you time,
lowers over-all
costs**

Cold finished steel moves
into position in J&L's
Controlled Atmosphere
Furnace



Why incur the trouble and costs of thermal treatments when J&L can do the job for you . . . quickly and economically? J&L's Controlled Atmosphere Furnace can be employed to improve the machinability or to meet the mechanical properties you need in your bar stock.

Order J&L Cold Finished Bars—thermally treated to the needs of your production line.

Jones & Laughlin Steel Corp., Dept. 404
3 Gateway Center, Pittsburgh 30, Pa.

Without obligation please send me your booklet "Extra Services to Users of Cold Finished Steel."

Name _____

Title _____

Company _____

Address _____

City _____ Zone _____ State _____

Jones & Laughlin
STEEL CORPORATION — Pittsburgh

**J&L
STEEL**

Water Soluble Cutting Fluid Eliminates Foul Odors



Johnson & Son has developed a water soluble coolant, TL-131, which is guaranteed not to turn rancid for two months.

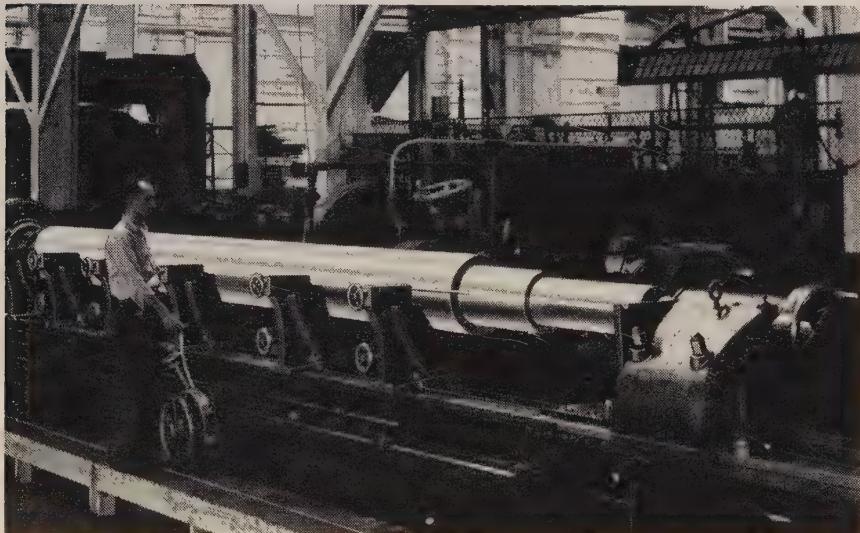
The so-called Monday morning odor is hydrogen sulphide gas released by bacteria in the machine. They live and multiply in the bottom of the coolant sump, along the coolant pipes and in the inaccessible corners of the machine.

Bacteria live primarily upon decaying organic matter.

TL-131 is all chemical in composition. It contains no fats or vegetable matter for bacteria to thrive on. (The lower photograph is a 500X enlargement of the bacteria.)

This coolant does not require the use of formaldehyde or bactericides. It is diluted 40 to 1 with

STEEL MILL ROLLS *by* TITUSVILLE FORCE



ALL TYPES AND SIZES FORGED AND GROUND TO YOUR SPECIFICATIONS

Plate rolls—bending rolls—back up rolls—straightening rolls—table rollers and other mill rolls are dependably forged and ground in any size—to any specification at Titusville Forge. Illustrated above is a straightening roll being ground on our 42" Landis Grinder. Size is 16" diameter x 28'3 $\frac{1}{8}$ " long, 40/45 scleriscope hardness.

Rely on Titusville Forge for mill rolls that meet your specific requirements.

water and used in the same way as any conventional water soluble coolant. The machine should be cleaned and then completely recharged.

The two-month cycle will carry the average shop through the hot, humid summer days when coolant odors are most widespread. S. C. Johnson & Son Inc., Racine, Wisconsin 2-1611

Spray Coating for Metal Equipment

The black coating is made of processed coal tar pitch mineral filler, solvent and granulated cork. Requiring no primer, one application produces a protective covering up to $\frac{1}{2}$ -in. in thickness. This new cork mastic was developed for use where metal tanks containing heated materials require corrosion protection and insulation.

Such combined protection is best suited for oil storage tanks, asphalt storage tanks, any metal tank containing materials heated up to 150° F., chemical plants or equipment, corrugated steel sidings and heating and ventilating ducts. This product will be sold under the trade name of Bitumastic K. Koppers Co. Inc., Tar Products Division, Pittsburgh 19, Pa. Express 1-3311.

STRUTHERS WELLS CORPORATION

TITUSVILLE FORGE DIVISION

TITUSVILLE, PA.

PLANTS AT TITUSVILLE, PA., and WARREN, PA.

Offices in Principal Cities

Struthers
Wells

New Line of Industrial Electric Motors

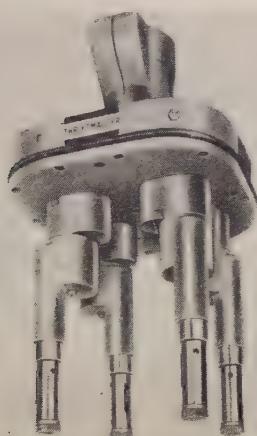
They are built to NEMA standards. In the dripproof design, a lower air opening in the end bell, combined with a steel baffle plate, gives the winding maximum protection against moisture and abrasive dusts. Double-end ventilation is provided by dual cast-aluminum fans. Efficiency is increased with a reduction in unit weight.

Currently, all standard ratings are available in frame sizes 182, 184, 213 and 215. The balance of the line, up to and including 30 hp, is being processed on an accelerated schedule. Lima will continue to produce its regular line of NEMA frame sizes. Lima Electric Motor Co., 136 Findlay Rd., Lima, O. Lima 2-9610.



Drillhead with Full Ball-Bearing Construction

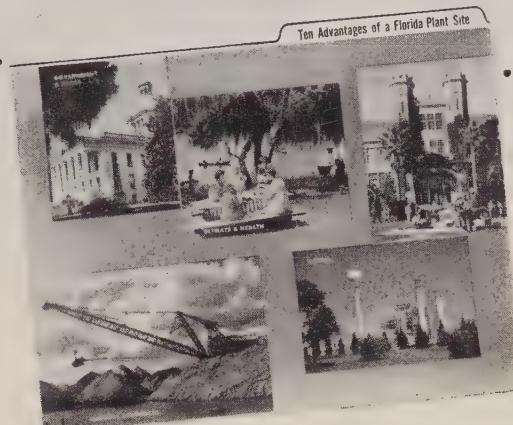
The spindles of this double eccentric, adjustable head have a large range of adjustment and may be set to drill irregular hole patterns. All spindles are provided with vertical or depth adjustment and are held rigid with a clamping device (it permits operation with or without spindle locating templates). There is no offset unsupported thrust load. Wide-faced stub-tooth gears provide maximum strength.



and quieter operation. The head is completely sealed against oil leakage or dust penetration and may be operated vertically, horizontally or inverted. Accuracy and dependability is comparable to fixed center head construction.

Twenty standard models are available, with 3, 4, 6 or 8 spindles having drilling capacities up to 1 1/16-in. diameter holes in steel. They may be used for drilling, reaming, tapping or boring and arranged to fit any conventional drilling machine. Thriftmaster Products Corp., 10448 N. Plum St., Lancaster, Pa. Lancaster 2-2101

Send for FREE Florida Information Kit



Industrialists and businessmen considering plant location, relocation, regional branch plants, offices and warehouses will find this kit a source of valuable guidance. Ten new solidly factual folders, conveniently packaged in a tabbed file cover, present what you need to know before selecting your location.

For your copy, write: State of Florida, Industrial Development Division, 3408K Caldwell Building, Tallahassee, Florida.

Information Kit Folders:

**MARKET • NATURAL RESOURCES • TRANSPORTATION
EDUCATION & CULTURE • POWER • LABOR • RESEARCH
HEALTH & CLIMATE • GOVERNMENT & TAXES • WATER**

{ Plan national sales conventions, sales conferences and state and regional meetings for Florida. Exceptional facilities for any type of meeting. Get double value... successful meetings in delightful surroundings plus colorful recreational activities. }

you'll always

do better in

Florida



TOUGH!

Is your present abrasive tough enough to prove itself in performance? You can't judge an abrasive by looks, claims or promises. The only test of any abrasive is its *cost per ton of castings cleaned*. Because of exclusive metallurgical characteristics, Malleabrasive gives you the lowest cost per ton cleaned of any premium abrasive on the market! This has been proved in hundreds of production tests by users throughout the country. Prove it in your own production test. WE GUARANTEE THAT MALLEABRASIVE WILL GIVE YOU LOWEST COST PER TON OF CASTINGS CLEANED.

To order Malleabrasive, or for additional information on running a test, contact Globe Steel Abrasive Company, Mansfield, Ohio.

MALLEABRASIVE

TRADE MARK
REBELL PAT OFF.

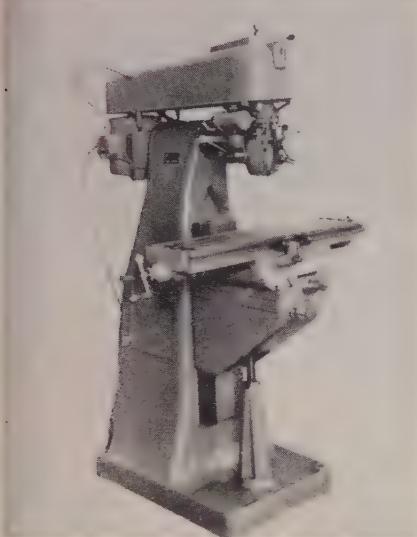
MALLEABRASIVE

PATENTED
BLAST CLEANING ABRASIVE
MANUFACTURED UNDER U.S. PATENT NO. 2184924
BY
GLOBE
STEEL ABRASIVE CO.
MANSFIELD OHIO
MADE IN U.S.A.

U. S. Patent # 2184926 (other patents pending)

Vertical Milling Machine

The machine has these features: Infinitely variable feed from 0.002 to 0.008 in. per revolution; 5½-in. of power quill travel; internally locked, completely enclosed, hard chrome plated quill; 800 lb of down thrust; coarse and fine hand feeds as well as power feed; variable positioning of coarse feed lever and quill lock handle; variability of feed rate while machine is in operation. The machine is available



with or without power table feed. It will include other new features incorporated into the standard hand-feed miller, such as the precision-honed head and overarm bosses and a quick-change collet bar. The accuracy of each unit will be certified by a check sheet accompanying each machine showing results of inspection tests.

A 1-hp, reversible, 3-phase, 60-cycle, 1200-rpm, 220/440-v motor drives the machine. Other motors are available. Drive is by B section V-belt direct from a 6-step motor pulley to a matching 6-step spindle pulley. A reversible drum-type switch is mounted in the guard, convenient to the operator. Prelubricated and shielded ball bearings are used. The weight of the machine is approximately 1600 lb. U. S. Burke Machine Tool Division, Cincinnati Mfg. Corp., Brotherton Rd., Cincinnati 27, O. Bramble 5000



Keep Up to Date on **STAINLESS STEEL PLATE and HEADS** with G. O. Carlson, Inc.

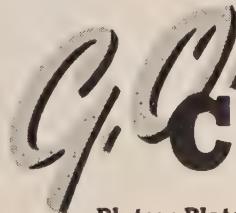
Weekly Stock Lists

Carlson's Weekly Stock List tells you just what you want to know:

- Type, Gauge, Width and Length of stainless steel plate in stock.
- Type, Size and Gauge of stainless steel heads in stock.
- Sales representatives and warehouse distributors ready to serve you.

Save time and money by checking this weekly list. If you do not see your requirements listed, please ask for what you need . . . you may be surprised how fast we can produce it! Carlson is first with what is probably the largest stock of stainless steel plate in one location—produced to meet chemical industry standards. Remember, Carlson is your one-stop source for complete package orders—including plates, heads, rings, circles, flanges, forgings, bars and sheets (No. 1 Finish).

Stainless Steels Exclusively



CARLSON, INC.

Plates • Plate Products • Forgings • Bars • Sheets (No. 1 Finish)

THORNDALE, PENNSYLVANIA

— District Sales Offices in Principal Cities —

Write for your copies
of Carlson's Weekly
Stock Lists...use this
convenient coupon.

Name _____

Company _____

Address _____

NEW Literature

Write directly to the company for a copy

Materials Handling

"Modern Lifting" presents information and illustrations on loading lifts, ramp eliminators, self-leveling ramps, production lifts, bridge lifts, paper roll lifts, etc. Specifications for each are included—4 pages. Globe Hoist Co., E. Mermaid Lane at Queen St., Philadelphia 18, Pa.

Lubrication Chart

This wall chart offers lubrication recommendations for such industrial applications as hydraulic systems, spindles, air compressors, reduction gears, electric motors and oven conveyors. It is printed in two colors on tough, varnished stock—E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

Tube Bending

Full information on the model-824, bench-mounted, manual tube bender with toggle clamp is offered—cata-

log 1141A10, 7 pages. W. D. Wynant Tube & Hose Fitting Div., Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, O.

Fabricated Steel Presses

Series-G1 gap presses (from 75 to 200 tons) are the subject of this bulletin. Photographs supplement text—11 pages. Minster Machine Co., Minster, O.

Alcaloy

Properties and uses for this copper-aluminum alloy are given. A list of products made from it, such as chain and accessories, safety tools and parts for industrial equipment, is included—32 pages. Alcaloy Inc., 13124 Shaker Square, Cleveland, O.

Vertical Milling Machine

This brochure covers model VM-2, and includes a photograph which shows working parts—4 pages. Elgin Tool Works Inc., 1770 Berteau Ave. at Ravenswood, Chicago 13, Ill.

Weights, Measures

Here is an opportunity to get tables on sheet gages, hardness and temperature conversion, properties of metals and their approximate weights, pipe sizes with dimensions and weights, relative sizes of ingots and forgings at various reductions—92 pages. Mesta Machine Co., Pittsburgh 22, Pa.

Heat Treating

Here is an account of how mechanized, standard-rated furnaces cut labor, reduce floor space and increase production at minimum cost—SC-169, 4 pages. Surface Combustion Corp., Toledo 1, O.

Batteries

PlastiCell batteries have been designed for switchgear, control and auxiliary power applications. Design and functional characteristics are briefly stated in this folder. Literature on the PlastiCal (lead-calcium) batteries for floating service is also available—4 pages. C & D Batteries Inc., Conshohocken, Pa.

Blind Rivet

This fastener is set by a special gun which pulls the stem into the hollow shank, upsets a head on the blind side and fills the hole in the work—bulletin TL-99. Townsend Co., New Brighton, Pa.

Pressure Filter

Operation of the Hoffman-Hygrade self-cleaning pressure filter is described in this bulletin. The filter is designed to remove sludge formed by dissolving electrodes and to prevent dust, dirt and oil contamination.

The advertisement features a large image of several broaching tools, including a long bar with multiple broaches and some smaller components. To the right of the tools, the text "useful data for you" is written vertically. Below this, a small image of a catalog titled "American's revised catalog 450 of Broaches, Broaching Machines and Broaching applications" is shown. At the bottom, a call-to-action button reads "write for your free copy today!"

American BROACH & MACHINE CO.
A DIVISION OF SUNDSTRAND MACHINE TOOL CO.
ANN ARBOR, MICHIGAN

See American First — for the Best in Broaching Tools, Broaching Machines, Special Machinery





The "Unseen Hand" at the Controls . . .

AUTOMATICALLY SENSITIVE

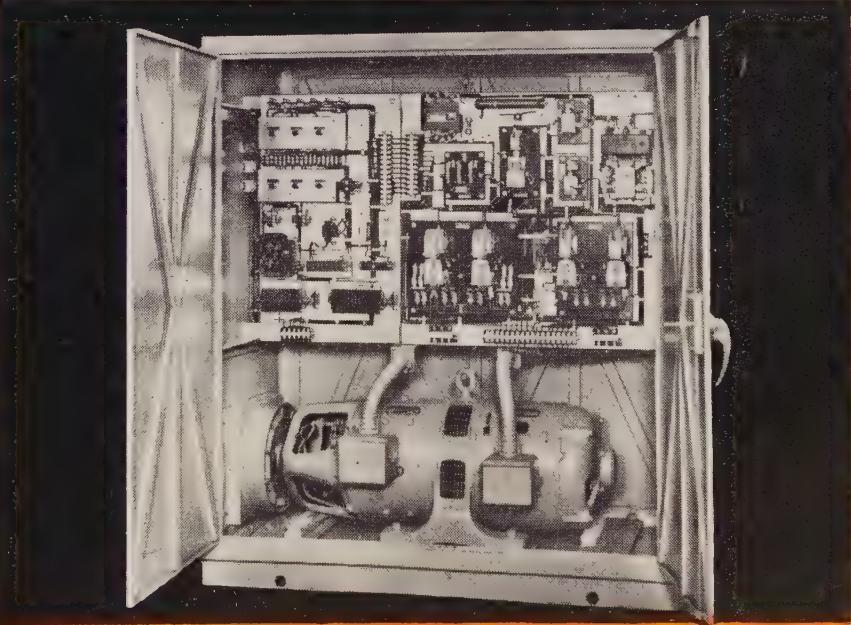
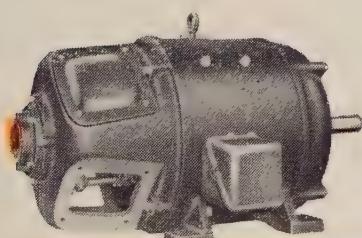
Performance-Rated®



SELECTIVE SPEED DRIVE

More accurately than the most experienced operator, Performance-Rated Century Selective Speed Drives automatically adjust motor speed to meet operating requirements. Speed changes are integrated with varying pressure, temperature, viscosity or size of the material being worked. You can also use Century Selective Speed Drives for starts, stops and jogs—forward or reverse—as required.

For full information and assistance on any motor drive application, AC or DC, call your nearest Century Sales Office ... or write us direct.



Performance-Rated
1/8 to 400 H. P.



CENTURY ELECTRIC COMPANY

1806 Pine St., St. Louis 3, Mo. • Offices and Stock Points in Principal Cities



To Help You Select the Best Speed Reducer for Each Job

Horsburgh & Scott's new catalog provides you with all the information necessary for the proper selection of speed reducers.



Complete size range available, including new sizes.

New ratios and ratings for Worm Helical Speed Reducers shown.

Increased Overhung Load capacities are listed and explained.

Detail dimensions of standard worms and gears are given to help you "build-in" Horsburgh & Scott Speed Reducers.

New Rating Tables—more complete than ever before—easier to use.

Engineering Data Section—more tables and data you want.

All this information and much more is available in this catalog to you for the asking. Just write us on your letterhead for catalog 55 —no charge, no obligation.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 Hamilton Avenue
Cleveland 14, Ohio

NEW LITERATURE

of metal parts during plating—bulletin HH103, 2 pages. U. S. Hoffman Machinery Corp., 105 Fourth Ave., New York 3, N. Y.

Induction Heating

Typical applications for forging, hardening, annealing and metal joining are discussed. Equipment designed to handle the more common operations and specialized work-handling machines are described—booklet B-6519, 12 pages. Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

Foundry Cleanliness

Immediate steps toward better, safer and cleaner foundry working conditions can be taken, this bulletin claims. It also describes recently developed products that help hold foundry dust to a minimum—FP-126. Frederic B. Stevens Inc., Detroit 16, Mich.

Process Equipment

This book describes and gives specifications for shell molding and closing machines—2642. Link-Belt Co., Dept. PR, 307 N. Michigan Ave., Chicago 1, Ill.

Plastics Tooling

Polymer Progress gives current information on resin technology. This issue contains articles on Epon 828 in tooling applications, the chemistry of curing epoxy resins, Epon adhesives in military applications and experimental epon curing agent U.—March, 1955, No. 1, 14 pages. Shell Chemical Corp., 50 W. 50th, New York 20, N. Y.



FILMS AVAILABLE

Machining

"Production Band Machining" shows how jobs accomplished with accepted methods can be done faster with this new technique—16 mm, 30 min. DoAll Co., Film Div., Des Plaines, Ill.

Metal Cutting

This movie explains the theory, application and benefits of electrical discharge machining. Metal is cut by a tool softer than the product. The Elox method cuts shapes into the hardest metals, including tungsten carbide, in less than 20 minutes. Elox Corp., 740 N. Rochester Rd., Clawson, Mich.

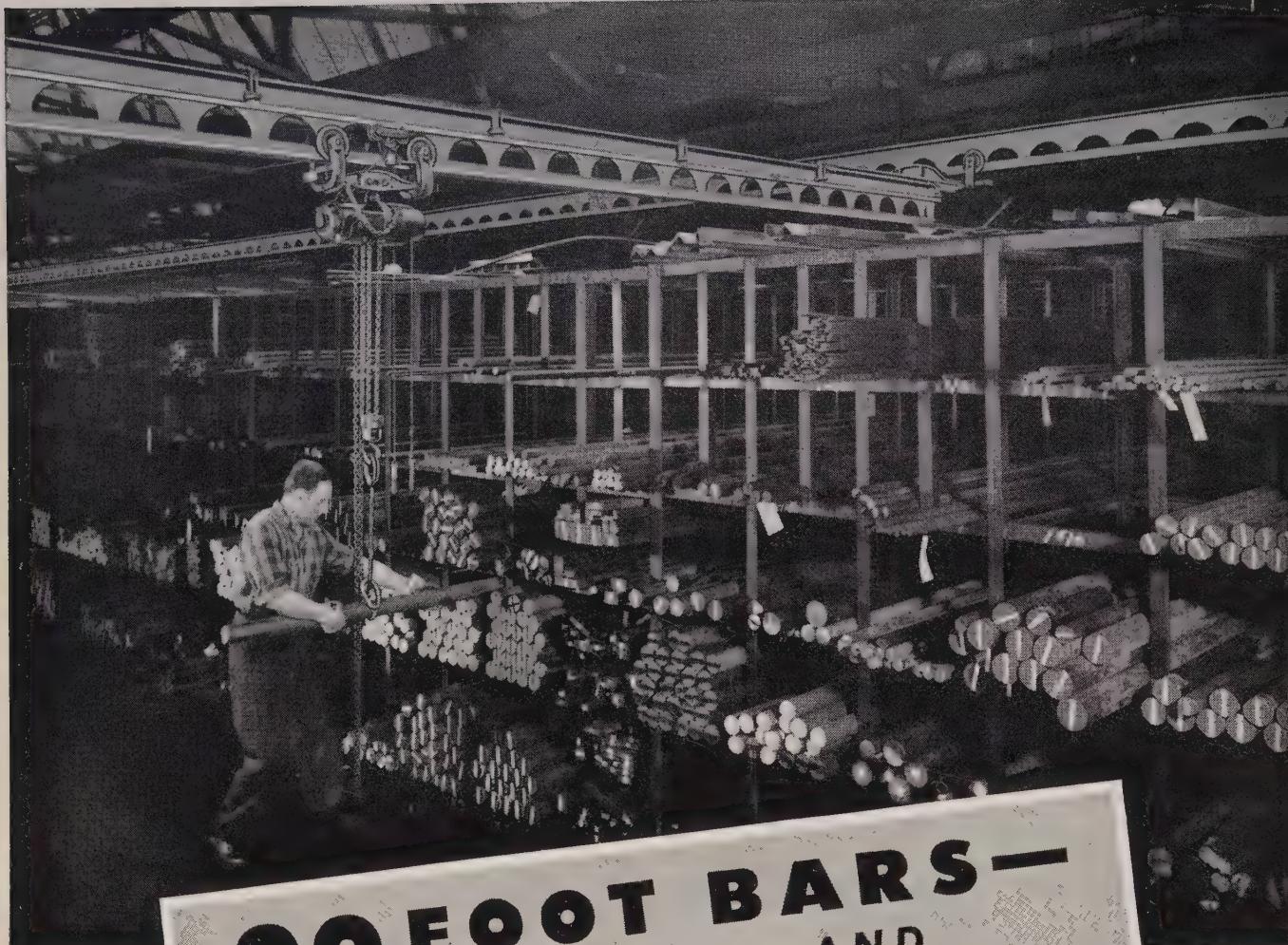
MOULDINGS of Superior Stainless

for
hundreds of
industrial
and
commercial
applications

strip steel

Here's *usable beauty* for exacting service . . . wear-resistant, hard, bright and strong throughout! SUPERIOR STAINLESS forms smoothly and easily because it is uniform in every physical quality: facts proved by the mile in mouldings manufacture every day. • May we serve *your* stainless steel strip applications?

Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA



20 FOOT BARS— STORED AND HANDLED EFFICIENTLY

It is not only faster and easier to store and handle stock this way, but safety is greatly improved.

WITH a simple rack arrangement and overhead tramrail crane to serve it, long unwieldy steel stock can be stored in an orderly fashion and grouped according to shape, size and alloy.

The smooth rolling crane with hand-propelled or electric hoist makes it easy for a man to handle the bars in and out of the rack and deliver them to the saws or machine tools directly without rehandling.

What a vast improvement this is over the haphazard time-consuming way of storing and handling stock still prevalent in so many plants today. There is no tugging, luggering and back-breaking lifting while

searching for stock needed. The stock is always in its place where it is quickly found. There is no uncertainty as to the amount on hand, because the supply is out in the open where it can always be seen.

Hundreds of metal-working plants and steel warehouses are now enjoying the many advantages that Cleveland Tramrail equipment provides. There are installations of every type from simple hand-propelled carriers and cranes to complete automatic systems that transport materials without need of accompanying operator.

GET THIS BOOK!
BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy



CLEVELAND TRAMRAIL 
OVERHEAD MATERIALS HANDLING EQUIPMENT

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7803 East 284th Street, Wickliffe, Ohio

April 11, 1955

Market Outlook

STEEL DEMAND and production have leveled off.

Both are high and should remain so most of this quarter.

It's neither surprising nor alarming that an end of the upsurge has come. An uptrend must end sometime. The leveling off came only after output climbed to 95 per cent of capacity.

HORIZONTAL MOVEMENT—Holding at 95 per cent in the week ended Apr. 10, the ingot production rate stood still for the second consecutive week. Until two weeks ago the rate had risen continuously since the first of the year. At the beginning of the first quarter, the ingot rate was only 75 per cent. It was 95 per cent at the start of the second.

All the country's steelmaking districts are not sharing alike in the high rate of steelmaking. Five districts are below the national average and eight are at or above it.

BACKLOG—Promising a high level of steel output in the second quarter are orders on the books. There's little likelihood of any sizable cancellations. All indications point to a good level of business among steel consumers through the second quarter. If anyone does find he has ordered more steel than he will consume this quarter, he is unlikely to cancel out his order. With a steel price increase likely at mid-year, steel in inventory will be better than money in the bank.

NONFERROUS PRICES UP—On other metal fronts, price rises are the order of the day. Zinc went up last week ½-cent a pound to 12 cents, but it won't affect prices of galvanized sheets and pipe. Their price depends on what

price bracket zinc is in. Although zinc rose, it did not move into the next bracket. Other nonferrous metals that have moved upward in price in the last three weeks are copper, tin and magnesium. Aluminum went up in January.

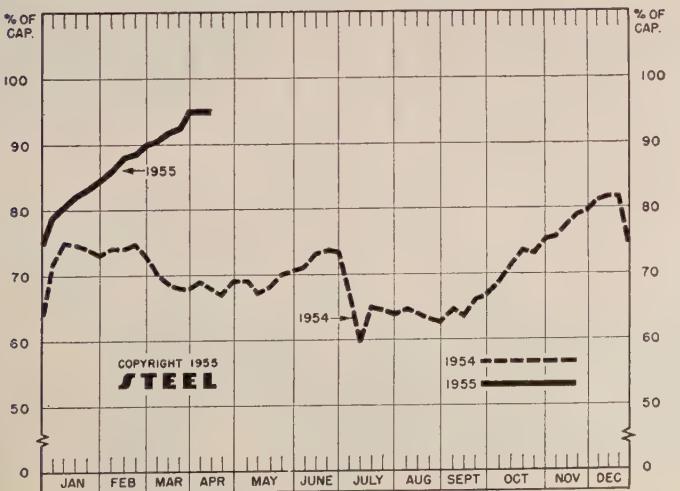
STEEL IS STEADY—The last general increase in steel prices was last July, following a steelworkers' wage increase. STEEL's price composite on finished steel at the mill level holds at \$118.40 a net ton. There were some minor price changes, however. Steel warehouses continue to raise prices on seconds and waster sheets. At Chicago, the average boost was \$7 a ton. These items rise and fall in relation to demand for prime sheets.

TITANIUM'S CHEAPER—In contrast to the price rises in zinc, copper, tin and magnesium is the decline in the price of another nonferrous metal—titanium sponge. It went down 50 cents a pound on one grade and 55 cents on another. Like any new product, titanium is dropping pricewise as it becomes more plentiful.

STEEL's price composite on steelmaking scrap remains at \$37.41 a gross ton despite the high rate of steel production. Even though scrap consumption has gone up, the steel plants have enlarged their scrap inventories. The mills have not increased scrap consumption so much as pig iron.

ORE STOCKS SHRINK—This heavy usage of iron had cut stocks of Lake Superior iron ore at blast furnaces and Lake Erie docks on Apr. 1 to about 22.6 million gross tons—lowest on that date since the record steelmaking year of 1953. The lake ore boats should be busier this year than last.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES
(Percentage of capacity engaged)

	Week Ended Apr. 10	Change	Same Week 1954	Week 1953
Pittsburgh	97	0	71	97.5
Chicago	96	+ 0.5	74.5	106
Mid-Atlantic	95	+ 1	62	96.5
Youngstown	96	0	69	105.5
Wheeling	92.5	+ 3	74.5	101
Cleveland	101.5	- 0.5*	67	104
Buffalo	104.5	+ 4.5*	67.5	106.5
Birmingham	87.5	0	77	101
New England	82	+ 12	51	91
Cincinnati	91.5	+ 3.5	69	98.5
St. Louis	95	0	62.5	71.5
Detroit	92	+ 2	66	109
Western	97	- 1	77	110
National Rate ..	95	0	68	98

INGOT PRODUCTION†

	Week Ended Apr. 10	Month Ago	Month Ago	Year Ago
INDEX	141.7†	141.8	139.5	101.0
(1947-1949=100)				
NET TONS ...	2,276†	2,278	2,241	1,622
(In thousands)				

*Change from preceding week's revised rate.
†Estimated. ‡Amer. Iron & Steel Institute.
Weekly capacity (net tons): 2,413,278 in 1955;
2,384,549 in 1954; 2,254,459 in 1953.

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Apr. 5 1955	Mar. 29 1955	Month Ago	Mar. Average
(1947-1949=100)	144.7	144.7	144.7	144.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Apr. 5

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1...	\$4.25	Sheets, Electrical	\$9.350
Rails, Light, 40 lb	5.917	Strip, C.R., Carbon	7.493
Tie Plates	5.275	Strip, C.R., Stainless, 430 (lb)	0.415
Axes, Railway	7.500	Strip, H.R., Carbon	5.113
Wheels, Freight Car, 33 in. (per wheel)	48.500	Pipe, Black, Butt-weld (100 ft)	15.000
Plates, Carbon	4.675	Pipe, Galv., Butt-weld (100 ft)	18.605
Structural Shapes	4.517	Pipe, Line (100 ft)	146.804
Bars, Tool Steel, Carbon (lb)	0.430	Casing, Oil Well, Carbon (100 ft)	154.218
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.525	Casing, Oil Well, Alloy (100 ft)	227.875
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.115	Tubes, Boiler (100 ft)	†
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.610	Tubing, Mechanical, Car- bon	†
Bars, H.R., Alloy	8.875	Tubing, Mechanical, Stain- less, 304 (100 ft)	161.193
Bars, H.R., Stainless, 303 (lb)	0.423	Tin Plate, Hot-dipped, 1.25 lb	8.533
Bars, H.R., Carbon	5.000	Tin Plate, Electrolytic, 0.25 lb	7.233
Bars, Reinforcing	4.963	Black Plate, Canmaking Quality	6.333
Bars, C.F., Carbon	8.180	Wire, Drawn, Carbon	7.938
Bars, C.F., Alloy	11.375	Wire, Drawn, Stainless, 430 (lb)	0.545
Bars, C.F., Stainless, 302 (lb)	0.438	Bale Ties (bundle)	5.860
Sheets, H.R., Carbon ...	4.870	Nails, Wire, 8d Common..	7.815
Sheets, C.R., Carbon ...	5.864	Wire, Barbed (80-rod spool) roll)	7.097
Sheets, Galvanized	7.220	Woven Wire Fence (20-rod roll)	16.815
Sheets, C.R., Stainless, 302 (lb)	0.553	†Not available.	

STEEL's FINISHED STEEL PRICE INDEX*

	Apr. 6 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 avg.=100) ..	194.53	194.53	194.53	189.74	156.13
Index in cents per lb	5.270	5.270	5.270	5.140	4.230

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	\$118.40	\$118.40	\$117.82	\$113.70	\$93.18
No. 2 Fdry, Pig Iron, GT..	56.54	56.54	56.54	56.54	46.47
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.97
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	37.41	37.41	37.33	25.33	28.83

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Apr. 6 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.45
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.45
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	4.405	3.95
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	4.10-4.15
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.45
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.45
Shapes, deld. Philadelphia	4.53	4.53	4.53	4.38	3.42
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.50
Plates, Chicago	4.225	4.225	4.225	4.10	3.50
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.10	3.60
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.50
Plates, Claymont, Del.	4.225	4.225	4.225	4.10	3.60
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.35
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.35
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.10
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.30
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.25
Strip, H.R., Chicago	5.75	5.75	5.75	5.45	4.18
Strip, C.R., Pittsburgh	5.85	5.85	5.85	5.70	4.30
Strip, C.R., Chicago	5.90	5.90	5.90	5.65	4.35-4.40
Wire, Basic, Pittsburgh	5.75	5.75	5.75	5.525	4.50
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.30
Tin Plate (1.50 lb), box, Pitts.	\$9.05	\$9.05	\$9.05	\$8.95	\$7.50

SEMITRANSHISHED STEEL

Billets, Forging, Pitts. (NT)	\$78.00	\$78.00	\$78.00	\$75.50	\$63.00
Wire Rods, 7/8-1" Pitts.	4.675	4.675	4.675	4.525	3.85

PIG IRON, Gross Ton

Bessemer, Pitts.	\$57.00	\$57.00	\$57.00	\$57.00	\$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	59.66	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	60.16	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	42.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.43	49.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne.	190.00†	190.00†	190.00†	200.00†	175.00

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	\$38.50	\$38.50	\$38.50	\$26.50	\$32.25
No. 1 Heavy Melt, E. Pa.	37.75	37.75	39.50	22.00	25.25
No. 1 Heavy Melt, Chicago	36.00	36.00	34.00	27.50	29.00
No. 1 Heavy Melt, Valley	37.50	37.50	37.50	24.50	32.75
No. 1 Heavy Melt, Cleve.	35.00	35.00	35.00	21.50	29.25
No. 1 Heavy Melt, Buffalo.	32.50	32.50	32.50	23.50	29.75
Rails, Rerolling, Chicago	52.50	50.50	49.50	34.50	46.50
No. 1 Cast, Chicago	41.50	41.50	40.00	36.00	41.00

COKE, Net Ton

Beehive, Furn, Connsvl.	\$13.75	\$13.75	\$13.75	\$14.75	\$14.25
Beehive, Fdry, Connsvl.	16.75	16.75	16.75	16.75	16.00

Oven, Fdry, Chicago	24.50	24.50	24.50	24.50	21.00
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Quotations in cents per pound based on COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size a refinery, unpacked; ALUMINUM, primary ingots, 99+%, deld.; MAGNESIUM 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

• A source of price information.

Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.

• A directory of producing points.

Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.

• A source of price data for making your own comparisons. Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.

• A source of information on market trends.

Newspaper items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.

• Reports on iron and steel production, and materials and product shipments.

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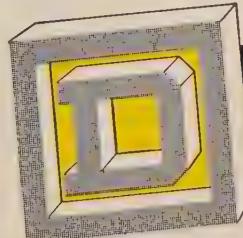
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Nonferrous Metals

Big civilian usage of metals is vital insurance in case of war. Large production capacity to fill such demands can be diverted to defense purposes when needed

Nonferrous Metal Prices, Pages 154 & 155

LITTLE BY LITTLE, the pattern of the government's dealings in non-ferrous metals is taking on meaning. Both stockpiling itself and the subsequent release of metal from stockpile during emergencies stem from fear that some day this country will get into a shooting war and be caught with insufficient capacity in strategic materials.

Perhaps that isn't a new slant on the situation, but there is new evidence that it is true. One official of the Business & Defense Services Administration told STEEL that the government is not satisfied with the size of the civilian markets for aluminum and magnesium. Why? Because a large civilian consumption necessarily implies a large capacity to produce, a capacity which could be diverted to military usage in case of war. Right now, government and other defense uses are taking a relatively high percentage of both metals, leaving what some governmental officials believe to be an insufficient cushion for an emergency. The stockpile is an effort to provide that cushion.

Proper Attitude — This attitude goes a long way toward explaining the willingness of the government to co-operate with industry in releasing stockpile-bound aluminum and restricting export quotas. When industry first asked for governmental help, the chances of getting it were not good, because the shortage was not considered serious enough. But as the clamor became louder, the government evidently decided it couldn't afford to let any temporary shortage interfere with the growth of this important industry. This attitude also explains the turnaround in governmental planning for another round of expansion (STEEL, Mar. 28, p. 124). The more capacity the industry has, the more is available for defense uses when it's needed.

The situation is especially critical in magnesium. Figures are not available to show what proportion of production goes to defense now, but it must be high. Production for all purposes is small by comparison with many of the nonferrous metals. For instance, shipments of magnesium mill products during February were

only 1,648,000 lb. During a total emergency, it is doubtful if that kind of production would satisfy defense

STEEL's Metal Price Averages for Mar., 1955

(Cents per pound)

Electrolytic Copper, deld.	
Connecticut	33.222
Lead, St. Louis	14.800
Prime Western Zinc,	
E. St. Louis	11.500
Straits Tin, New York ..	91.176
Primary Aluminum	
Ingots, deld.	23.200
Magnesium, Freeport,	
Tex.	27.556
Nickel, f.o.b. refinery ..	64.500

needs. Thus the government is interested in expanding the civilian market for this metal.

Copper Gets More Help

The latest governmental action in copper, which makes approximately 18,000 tons available to civilian users during the second quarter, is expected to help fill the gap between supply and increasing demand, but it won't solve the industry's problems. The quarterly "Copper Industry Report," issued by the Business & Defense Services Administration, indicates that demand in the second quarter will exceed that of the first quarter by about 25 million lb despite lower Defense Materials System requirements. The report points out: "While demand for refined copper has increased for the first half of 1955, the domestic supply has risen also, but not to the same extent, thus resulting in a shortage."

The settlement of the labor contract at Anaconda's Chuquicamata mine in Chile averted a strike that would have damaged seriously the U. S. and world supply lines. U. S. copper men seem confident that the new price of copper—36 cents—will lure more of the Chilean metal to our shores. Temporarily, at least, the tension has eased. But many producers wonder where the copper is going to come from next year when

the government wants its doles returned.

Zinc Price Goes Up

After much talk about a price increase for zinc—and just as much denial from the producers—the action finally came on Apr. 5. The increase of 0.5 cent matched the last increase of Sept. 3, 1954. St. Joseph Lead Co. initiated the hike, and at press time the others were expected to follow suit. The price a year ago was 10.25 cents a pound, compared with 11 cents today. Reduced stocks and heavy demands for all grades over the last several weeks have been putting the pressure on price.

Tin Report Shelved Again

As reported in this column two weeks ago (STEEL, Mar. 28, p. 124), the Senate committee's report on the essentiality of the Texas tin smelter got another reprieve, this time until Apr. 30. Nathan Trotter & Co., New York, says the report did not agree with the views of Sen. Lyndon B. Johnson (Dem., Tex.). Nathan Trotter goes on to say: "This further delay will no doubt throw tin onto the market that is now under contract with our government. The amount which will become promptly available may not be large, but . . . we wouldn't be surprised to see an increase (soon) in supplies of not only nearby but future tin."

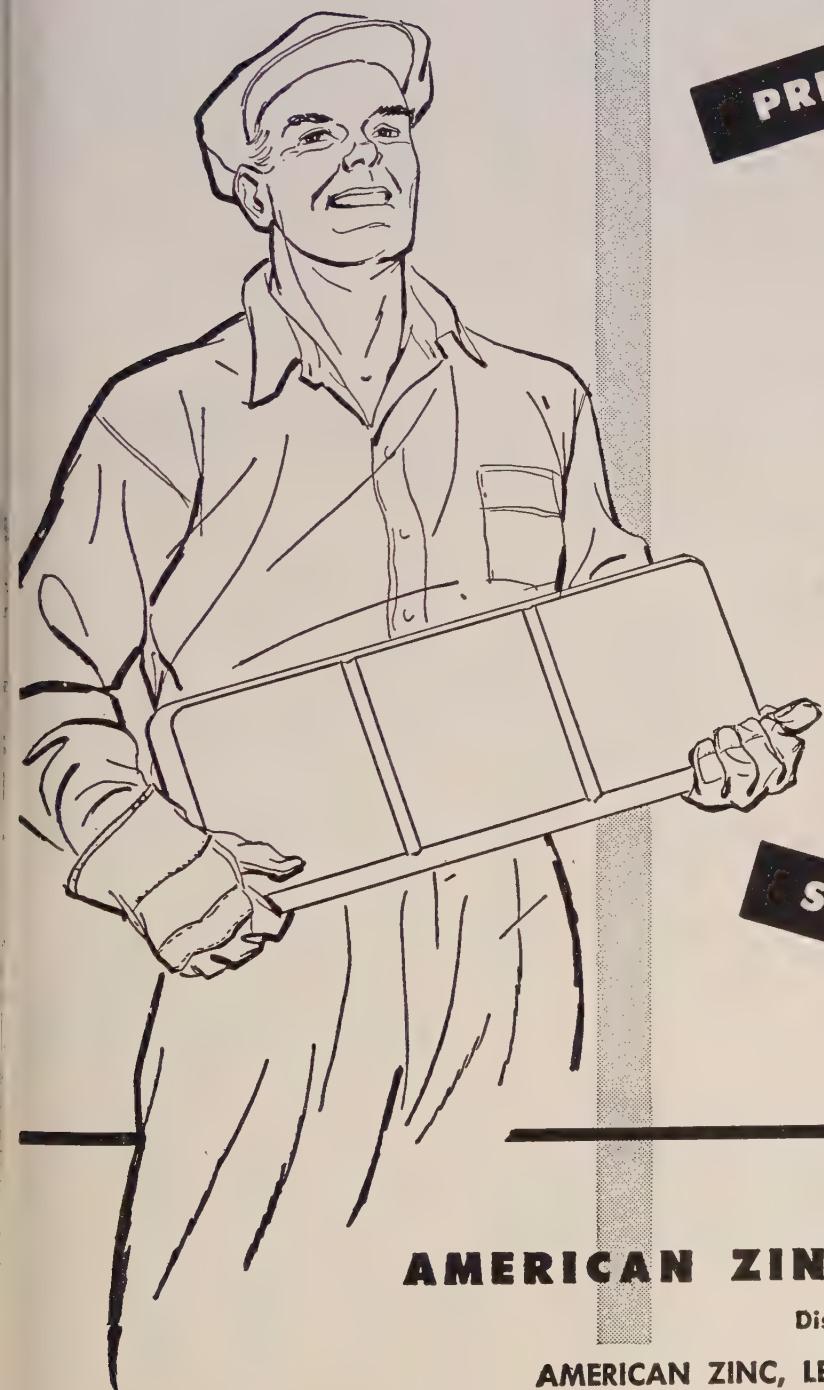
Market Memos

- You can disregard rumors of a current price hike for aluminum. A high official in one of the primary companies categorically denies that any of the prime producers will boost prices this month, and probably not until contract time in the summer.
- Howard I. Young, president American Zinc, Lead & Smelting Co., reported to stockholders that the South Friends Station mine in Tennessee will probably start production in early July. Another mine in the southeast Jefferson City area (Tennessee) will be in production in 1956.
- E. I. du Pont de Nemours & Co. Inc. followed the lead of Titanium Metals Corp. of America and lowered the price of its titanium sponge by 55 cents a pound on Grade A-1 ductile and by 50 cents a pound on Grade A-2 sponge, effective Apr. 1.

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Chicago

St. Louis

New York

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 23.20, pigs 21.50, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 25.00; No. 43, 5% Si, 24.80; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 26.20; No. 195, 4.5% Cu, 0.8% Si, 25.50; No. 214, 3.8% Mg, 26.20; No. 356, 7% Si, 0.3% Mg, 24.90.

Antimony: R.M.M. brand, 99.5%, 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, \$71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, \$72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, \$40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: \$2.25 per lb, ton lots.

Cadmium: Sticks and bars, \$1.70 per lb, deld. **Cobalt:** 97-99%, \$2.60 per lb for 550-lb keg; \$2.62 per lb for 100-lb case; \$2.67 per lb under 100 lb.

Columbium: Powder, \$118.30 per lb, nom.

Copper: Electrolytic 36.00 deld. Conn. Valley; 36.00 deld. Midwest; Lake 36.00 deld; Fire refined 35.75 deld.

Germanium: 99.9%, \$295 per lb, nom.

Gold: U. S. Treasury, \$35 per oz.

Indium: 99.9%, \$2.25 per troy oz.

Iridium: \$90-\$120 nom. per troy oz.

Lead: Common 14.80, chemical 14.90, corrodin 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 98%, \$10-\$14 per lb, depending on quantity.

Magnesium: 99.8%, self-palletizing pig 28.50; notched ingot 29.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J. and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks 1.3 in. diameter, 47.50, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 34.00; alloy M 36.00, 10,000 lb or more, f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J.

Mercury: Open market, spot, New York, \$320-\$323, per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced \$3-\$3.25 per lb; pressed ingot \$4.06 per lb; sintered ingot \$5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: \$120-\$130, nom., per troy oz.

Palladium: \$17-\$20 per troy oz.

Platinum: \$76-\$80 per troy oz from refineries.

Radium: \$16-\$21.50 per mg radium content, depending on quantity.

Rhodium: \$118-\$125 per troy oz.

Ruthenium: \$45-\$56 per troy oz.

Selenium: 99.5%, \$6-\$7.25 per lb.

Silver: Open market, 87.00 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod \$68.70 per lb; powder \$40.20 per lb.

Tellurium: \$1.75 per lb.

Thallium: \$12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 91.50.

Titanium: Sponge, 99.3+ %, grade A-1 ductile (0.3% Fe max) \$3.95, grade A-2 (0.5% Fe max) \$3.50 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots \$4.35-\$4.40 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99 + % hydrogen reduced, \$4.65. Treated ingots \$6.70.

Zinc: Prime Western, 12.00; brass special 12.25; intermediate, 12.50, E. St. Louis, freight allowed over 0.50 per pound. High grade, 13.55; special high grade, 13.50. Diecasting alloy ingot No. 3, 16.00; Nos. 2 and 5, 16.50.

Zirconium: Sponge \$10 per lb; powder electronics grade \$15, flash grade \$11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy 31.00-31.75; No. 12 foundry alloy (No. 2 grade) 29.25-30.50; 5% silicon alloy, 0.60 Cu max, 31.25-32.25; 13 alloy; 0.60 Cu max, 31.25-32.25; 18 alloy 30.75-33.00; 108 alloy 30.00-31.00; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 30.75-32.50; grade 2, 30.00-31.50; grade 3, 29.25-30.50; grade 4, 28.75-29.50.

Brass Ingot: Red brass No. 115, 37.00; tin bronze No. 225, 48.50; No. 245, 42.25; high-leaded tin bronze No. 305, 41.00; No. 1 yellow, No. 405, 32.25; manganese bronze No. 421, 34.75.

Magnesium Alloy Ingot: AZ63A, 31.00; AZ91B, 26.00; AZ91B, 31.00; AZ92A, 31.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, \$1.74; rod, bar, wire, \$1.71.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 41.35-42.45; 30,000-lb lots, 41.48-42.58; l.c.l., 41.98-43.08. Weatherproof, 100,000 lb, 40.78-41.60; 30,000 lb, 41.03-41.85; l.c.l., 41.53-42.35. Magnet wire deld., 15,000 lb or more, 48.15-49.31; l.c.l., 48.90-50.06.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more \$20 per cwt; pipe, full coils \$20 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, \$15; sheared mill plate, \$12; strip, \$15; wire, \$10; forging billets, \$9; hot-rolled and forged bars, \$9.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets 23.00, ribbon zinc in coils, 19.00-20.50; plates 18.00-22.25.

ZIRCONIUM

Plate \$27; H.R. strip \$28; C.R. strip \$35; forged or H.R. bars \$27; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks	65	...	...

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or —Round— —Hexagonal— across flats 2011-T3 2017-T4 2011-T3 2017-T4

Drawn

0.125	63.5	62.0	...	...
0.156-0.172	53.9	52.3	...	...
0.188	53.9	52.3	...	66.8
0.219-0.234	51.1	49.5	...	...
0.250-0.281	51.1	49.5	...	63.7
0.313	51.1	49.5	...	60.8

Cold-finished

0.375-0.547	49.9	47.5	59.8	57.2
0.563-0.688	49.9	47.5	56.9	53.7
0.750-1.000	48.7	46.3	52.1	50.6
1.063	48.7	46.3	...	48.9
1.125-1.500	46.9	44.6	50.4	48.9

Rolled

1.563	45.7	43.4	...	...
1.625-2.000	45.1	42.8	...	47.2
2.125-2.500	44.0	41.7	...	...
2.563-3.375	42.7	40.5	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed over 499 lb)

Thickness	Flat	Sheet	Circles*	Colled
Range	Sheet	Sheet	Sheet	Sheet
0.249-0.136	35.9	40.4	...	...
0.135-0.096	36.4	41.3	...	...
0.095-0.077	37.1	42.3	34.6	39.6
0.076-0.061	37.7	43.2	34.8	39.8
0.023-0.019	40.4	46.9	37.1	42.6
0.018-0.017	41.2	47.7	37.7	43.5
0.016-0.015	42.1	48.6	38.5	44.7
0.014	43.1	49.5	39.5	46.0
0.013-0.012	44.3	50.3	40.2	47.0
0.011	45.3	51.1	41.4	48.6
0.010-0.0095	46.5	51.9	42.5	50.2
0.009-0.0085	47.8	52.7	44.0	52.3
0.008-0.0075	49.4	53.5	45.2	54.1
0.007	50.9	54.3	46.7	56.4
0.006	52.5	55.1	48.1	56.1

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.6	38.8
5050-F	35.7	39.9
3004-F	36.7	41.6
5052-F	38.4	43.4
6061-T6	39.6	44.0
2024-T4	41.8	47.9
7075-T6*	49.6	56.2

*24-48 in. widths or diam., 72-180 in. lengths.

ALUMINUM

Forging Stock: Round, Class 1, 47.80-37.30, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 53.60-41.00 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)	Nom. Pipe Size (in.)
%	\$ 49.50
1	25.35
1 1/4	34.30
1 1/2	41.00

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 97.00, 0.064-in. 76.00, 0.125-in. 61.50, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled AZ31, 53.00, 20,000 lb or more, 0.250-in. and over widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, 1/4-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, 1/2 x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x 1/4-in. 72.90, 2 x 2 x 1/4-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)				
Aluminum:	1100 clippings	17.50-18.50;	old sheet	
	14.00-16.00;	borings and turnings	9.50-10.50;	
	crankcases	14.00-16.00;	industrial casting	
	14.00-16.00.			

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f			
	Sheet,	Strip,	Plate	Rod	Seamless	Clean	Rod	Clean
	Sheet	Strip	Plate	Rod	Tube	Heavy	Ends	Turnings
Copper	54.76b	52.36c	...	...	54.82	32.000	32.000	31.250
Yellow Brass	46.27	46.21d	46.81	49.18	23.875	26.625	22.000	22.000
Red Brass, 85%	50.99	50.93	51.53	53.80	28.125	27.875	27.375	27.375
Low Brass, 80%	49.75	49.69	50.29	52.56	27.000	26.750	26.750	26.750
Naval Brass	49.99	44.30	57.05	53.15	22.125	21.875	21.375	21.375
Com. Bronze, 90%	52.78	52.72	53.32	55.34	29.250	29.		

Copper and Brass: Heavy copper and wire No. 32.00-32.50; No. 2 copper 30.00-31.00; light copper 29.00-29.50; No. 1 composition red brass 26.00-26.50; No. 1 composition turnings 25.00-25.50; yellow brass turnings 16.00-16.50; new brass clippings 21.50-22.00; No. 1 brass rod turnings 19.50-20.00; light brass 17.00-17.50; heavy yellow brass 18.50-19.00; new brass rod ends 19.50-21.00; auto radiators, unsweated 20.00-20.50; cocks and faucets 20.50-21.50; brass pipe 20.00-21.50.

Lead: Heavy 11.50-11.75; battery plate 6.00-6.75; linotype and stereotype 13.50-14.50; electrolyte 12.00-12.50; mixed babbitt 12.00-14.00.

Magnesium: Clippings 18.50-19.50; clean castings 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.

Monel: Clippings 28.00-38.00; old sheet 28.00-32.00; turnings 21.00; rods 28.00-38.00.

Nickel: Sheets and clips 57.00-70.00; rolled anodes 57.00-70.00; turnings 40.00-55.00; rod ends 57.00-70.00.

Tin: No. 1 pewter 50.00-55.00; block tin pipe 70.00-75.00; No. 1 babbitt 45.00-48.00.

Zinc: Old zinc 4.75-5.50; new die cast scrap 4.75-5.00; old die cast scrap 3.25-3.50.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings 19.00-21.00; 3003 clippings 19.00-21.00; 6151 clippings 19.00-21.00; 5052 clippings 19.00-21.00; 2014 clippings 18.50-20.50; 2017 clippings 18.50-20.50; 2024 clippings 18.50-20.50; mixed clippings 18.00-20.00; old sheet 17.50-18.50; old cast 17.50-18.50; clean old cable (free of steel) 20.00-21.00; borings and turnings 17.50-19.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 48.00; light scrap 43.00.

Copper, Brass: No. 1 copper, 35.50-36.00; No. 2 copper, 34.00-34.50; light copper, 32.25; refinery brass (60% copper) per dry copper content, 31.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper, 35.00-35.50; No. 2 copper, 33.00; light copper, 31.25; No. 1 composition borings, 28.00-28.50; No. 1 composition solids, 28.50-29.00; heavy yellow brass solids, 22.00-22.50; yellow brass turnings, 21.50; radiators, 23.00-23.50.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes \$1.70 per lb.

Copper: Flat-rolled 51.42, oval 50.92, 5000-10,000 lb; electrodeposited 49.40, 2000-5000 lb lots; cast 50.54, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb \$1.015; 100-499 lb \$1.095; 500-4999 lb \$1.95; 5000-29,999 lb \$3.50; 30,000 lb \$1.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.

Tin: Bar or slab, less than 200 lb \$1.095; 200-499 lb \$1.08; 500-999 lb \$1.075; 1000 lb or more \$1.07.

Zinc: Bar 20.00, bar or flat top 19.00, ton lots.

CHEMICALS

Cadmium Oxide: \$2.15 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: 100 lb 76.80; 200 lb 76.05; 300 lb 75.80; 400-900 lb 75.05; 1000 lb and over 73.05; effective Mar. 24, 1955.

Copper Sulphate: Crystal, 100 lb 21.50; 200 lb 18.50; 300 lb 17.50; 400 lb 17.00; 500-1900 lb 15.50; 2000-10,000 lb 15.25; 10,000 lb and up 15.15. Powder, add 0.5 to above prices. Effective Mar. 29, 1955.

Nickel Chloride: 100 lb 46.50; 200 lb 44.50; 300 lb 43.50; 400-4900 lb 41.50; 5000-9900 lb 39.50; 10,000 lb and over 38.50. All prices eastern delivery, effective Jan. 1, 1955.

Nickel Sulphate: 100 lb 38.25; 200 lb 36.25; 300 lb 35.25; 400-4900 lb 33.25; 5000-35,900 lb 31.25; 36,000 lb 30.25. All prices eastern delivery, effective Jan. 1, 1955.

Silver Cyanide: Cents per ounce, 18 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb 70.10; 100-600 lb 55.90; 700-1900 lb 53.40; 2000-9900 lb 51.70; 10,000 lb or more 50.60.

Stannous Chloride (Anhydrous): Less than 50 lb \$1.558; 50 lb \$1.218, 100-300 lb \$1.068, 400-900 lb \$1.043; 1000-1900 lb \$1.019; 2000-4900 lb 98.20; 5000-19,900 lb 92.10, 20,000 lb and over 88.00.

Stannous Sulphate: Less than 5 lb \$1.258; 50 lb 95.80; 100-1900 lb 93.80; 2000 lb and over 91.80.

Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.

how *Norgren*

Spray-Lube

- increases tool life
- increases machine output

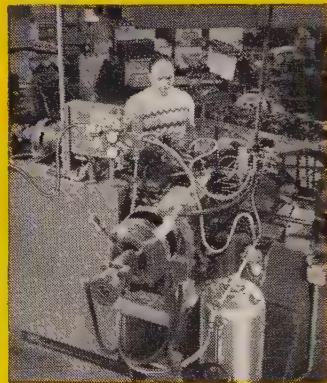
- lowers unit costs
- produces better finished products

TYPICAL EXAMPLES OF SPRAY-LUBE AT WORK



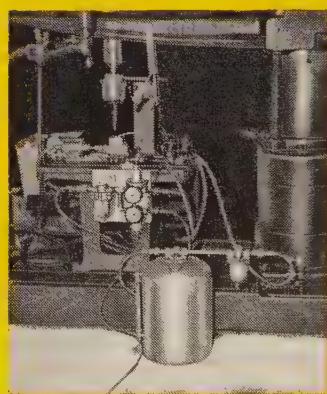
for O.K. Rubber, Inc.

Doubled output on turret lathe; increased surface cutting speed from 45 to 75 fpm; eliminated welding of chips to tool and galling of work pieces.



for A-P Controls Corp.

Increased tap life; speeded up tapping operations; reduced maintenance costs; improved housekeeping.



for Standard Tool & Machine Co.

Increased machine output 35%; improved quality of work; eliminated hand lubrication.



Oil Fog Lubricators
Pressure Regulators • Air Filters
Valves • Hose Assemblies

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company. Key on page 157. Key to footnotes, page 159.

SEMITINISHED

INGOTS, Carbon, Forging (NT)
Munhall, Pa. U5 \$61.50

INGOTS, Alloy (NT)

Detroit R7 \$65.00
Houston S5 70.00
Midland, Pa. C18 65.00
Munhall, Pa. U5 65.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Aliquippa, Pa. J5 \$64.00
Bessemer, Pa. U5 64.00
Bridgeport, Conn. N19 69.00
Buffalo R2 64.00
Clairton, Pa. U5 64.00
Ensley, Ala. T2 64.00
Fairfield, Ala. T2 64.00
Fontana, Calif. K1 72.00
Gary, Ind. U5 64.00
Johnstown, Pa. B2 64.00
Lackawanna, N.Y. B2 64.00
Munhall, Pa. U5 64.00
Pittsburgh J5 64.00
So. Chicago, Ill. R2 U5 64.00
So. Duquesne, Pa. U5 64.00
Youngstown R2 64.00

Carbon, Forging (NT)

Aliquippa, Pa. J5 \$78.00
Bessemer, Pa. U5 78.00
Bridgeport, Conn. N19 83.00
Buffalo R2 78.00
Canton, O. R2 80.00
Clairton, Pa. U5 78.00
Conshohocken, Pa. A3 83.00
Ensley, Ala. T2 78.00
Fairfield, Ala. T2 78.00
Fontana, Calif. K1 86.00
Gary, Ind. U5 78.00
Geneva, Utah C11 78.00
Johnstown, Pa. B2 78.00
Lackawanna, N.Y. B2 78.00
Los Angeles B3 87.50
Midland, Pa. C18 78.00
Munhall, Pa. U5 78.00
Pittsburgh J5 78.00
Seattle B3 91.50
So. Chicago R2 U5 W14 78.00
So. Duquesne, Pa. U5 78.00
So. San Francisco B3 87.50

Alloy, Forging (NT)

Bethlehem, Pa. B2 \$86.00
Buffalo R2 86.00
Canton, O. R2, T7 86.00
Conshohocken, Pa. A3 93.00
Detroit R7 86.00
Fontana, Calif. K1 105.00
Gary, Ind. U5 86.00
Houston S5 91.00
Ind. Harbor, Ind. Y1 86.00
Johnstown, Pa. B2 88.00
Lackawanna, N.Y. B2 86.00
Los Angeles B3 106.00
Massillon, O. R2 86.00
Midland, Pa. C18 86.00
Munhall, Pa. U5 86.00
So. Chicago, R2 U5 W14 86.00
So. Duquesne, Pa. U5 86.00
Struthers, O. Y1 86.00
Warren, O. C17 86.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 \$96.50
Canton, O. R2 96.50
Cleveland R2 96.50
Gary, Ind. U5 96.50
So. Chicago R2 W14 96.50
So. Duquesne, Pa. U5 96.50

SKELP

Aliquippa, Pa. J5 4.00
Fontana, Calif. K1 4.775
Munhall, Pa. U5 3.90
SparrowsPoint, Md. B2 3.90
Warren, O. R2 3.90
Youngstown R2, U5 3.90

WIRE RODS

Alabama City, Ala. R2 4.675
Aliquippa, Pa. J5 4.675
Alton, Ill. L1 4.85
Buffalo B11, W12 4.675
Cleveland A7 4.675
Donora, Pa. A7 4.675
Fairfield, Ala. T2 4.675
Fontana, Calif. K1 5.475
Houston S5 4.925
Indiana Harbor, Ind. Y1 4.675
Johnstown, Pa. B2 4.675
Munhall, Pa. U5 4.925
SparrowsPoint, Md. B2 3.90
Warren, O. R2 3.90
Youngstown R2, U5 3.90

Los Angeles B3 5.475
Minnequa, Colo. C10 4.925
Monessen, Pa. P7 4.675
No. Tonawanda, N.Y. B11 4.675

Pittsburgh, Calif. C11 5.325

Portsmouth P12 4.675

Roebling, N.J. R5 4.775

So. Chicago, Ill. R2 4.675

SparrowsPoint, Md. B2 4.775

Sterling, Ill. (1) N15 4.675

Sterling, Ill. N15 4.775

Struthers, O. Y1 4.675

Torrance, Calif. C11 5.475

Worcester, Mass. A7 4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala. City, Ala. R2 4.25

Aliquippa, Pa. J5 4.225

Ashland, Ky. (15) A10 4.225

Bessemer, Ala. T2 4.225

Bridgeport, Conn. N19 4.475

Buffalo R2 4.225

Canton, O. R2 4.225

Cleveland J5, R2 4.225

Coatesville, Pa. L7 4.225

Conshohocken, Pa. A3 4.225

Ecorse, Mich. G5 4.325

Fairfield, Ala. T2 4.225

Fontana, Calif. (30) K1 4.875

Gary, Ind. U5 4.225

Geneva, Utah C11 4.225

Harrisburg, Pa. C5 4.225

Houston S5 4.275

Ind. Harbor, Ind. I-2 4.225

Johnstown, Pa. B2 4.225

Kansas City, Mo. S5 4.35

Lackawanna, N.Y. B2 4.30

Milwaukee, Wis. F7 4.30

Midland, Pa. C18 4.30

Monaca, Pa. S17 4.30

Newark, N.J. P13 4.30

North Tonawanda, N.Y. B11 4.30

Pittsburgh, Calif. C11 5.00

Pittsburgh, Calif. P23 5.05

Portland, Oreg. O4 5.05

Seattle B3, N14 5.125

Sharon, Pa. S3 4.225

SparrowsPoint, Md. B2 4.225

Steubenville, O. W10 4.225

Warren, O. R2 4.225

Weirton, W.Va. W6 4.225

Youngstown R2, U5, Y1 4.225

Youngstown R2, U5 4.30

Youngstown R2, U5 4.30

Wide Flange

PLATES, Wrought Iron

Economy, Pa. B14 9.80

Bridgeport, Conn. N19 5.225

Buffalo R2 5.075

Canton, O. R2, T7 5.075

Clairton, Pa. U5 5.075

Detroit R7 5.075

Fontana, Calif. (30) K1 7.15

Gary, Ind. U5 6.45

Geneva, Utah C11 6.45

Houston S5 6.50

Ind. Harbor, Ind. I-2, Y1 6.45

Johnstown, Pa. B2 6.45

Kansas City, Mo. S5 5.325

Lackawanna, N.Y. B2 6.45

Midland, Pa. C18 6.45

Monaca, Pa. S17 6.45

Newark, N.J. W18 6.45

North Tonawanda, N.Y. B11 6.45

Pittsburgh, Calif. P23 6.45

Seattle B3 6.45

Sharon, Pa. S3 6.45

So. Chicago, Ill. U5, W14 6.45

So. San Francisco B3 7.05

Struthers, O. Y1 6.40

Youngstown U5, Y1 6.45

Youngstown U5 6.45

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Ind.Harbor,Ind. I-2, Y1.4.30	SHEETS	Gary,Ind. U5 6.10	Weirton,W.Va. W6 7.50	SHEETS, Galvanized High-Strength Low-Alloy
Johnstown,Pa. B2 4.30	SHEETS, Hot-Rolled Steel (18 Gage and Heavier)	Ind.Harbor,Ind. I-2, Y1.6.10	Youngstown Y1 7.50	Dravosburg,Pa. U5 8.20
KansasCity,Mo. S5 4.55		Lackawanna(35) B2 6.10		SparrowsPoint(30) B2 8.20
Lackawanna,N.Y. B2 4.30		Munhall,Pa. U5 6.10		SHEETS, Galvanized Steel
LosAngeles B3 5.00		Pittsburgh J5 6.10	Cleveland R2 5.55	Canton,O. R2 5.85
Milton,Pa. M18 4.30		Sharon,Pa. S3 6.10	Middletown,O. A10 5.45	Dravosburg,Pa. U5 5.85
Minnequa,Colo. C10 4.75		So.Chicago,Ill. U5 6.10	Warren,O. R2 5.55	Kokomo,Ind. C16 6.20
Niles,Calif. P1 5.00		SparrowsPoint(36) B2 6.10		Newport,Ky. N9 5.85
Pittsburg,Calif. C11 5.00		Warren,O. R2 6.10	Niles,O. N12 5.85	
Pittsburgh J5 4.30		Weirton,W.Va. W6 6.10		
Portland,Oreg. O4 5.05		Youngstown U5, Y1 6.10		
SandSprings,Oklahoma. S5 4.80	SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)			
Seattle B3, N4, P23 5.05		Ashland,Ky. A10.6.50	Ashland,Ky. A10 5.70	
Ecorse,Mich. G5 4.15		Canton,O. R2 6.50	SHEETS, Galvanized Ingot Iron	
Fairfield,Ala. T2 4.05		Dravosburg,Pa. U5.70	Ashland,Ky.(8) A10 5.70	
No.Duquesne,Pa. U5 4.30		Fairfield T2 5.70	Canton,O. R2 6.20	
So.SanFrancisco B3 5.05		Gary,Ind. U5 5.70	SHEETS, Galvanized Ingot Iron	
SparrowsPoint,Md. B2 4.30		Ind.Harbor,I-2 5.70	(Hot-dipped Continuous)	
Sterling,Ill.(1) N15 4.30		Ind.Harbor,I-2, Y1.4.30	Ind.Harbor,I-2 5.70	
Sterling,Ill. N15 4.40		Warren,O. R2 4.65	Butler,Pa. A10 5.70	
Struthers,O. Y1 4.30			Middletown,O. A10 5.70	
Torrance,Calif. C11 5.00				
Youngstown R2, U5 4.30	SHEETS, Cold-Rolled Steel (Commercial Quality)			
BARS, Reinforcing (Fabricated; to Consumers)				
Johnstown,Pa. 1/4-1" B2 5.70				
KansasCity,Kans. S5 6.50				
LosAngeles B3 5.95				
Marion,O. P11 5.55				
Pittsburgh J5, U8 5.72				
Seattle B3, N14, P23 6.15				
So.SanFrancisco B3 6.00				
SparrowsPt. 1/4-1" B2 5.70				
Williamsport,Pa. S19 5.60				
RAIL STEEL BARS				
Avis,Pa.(3) J8 4.25	SHEETS, H.R. (19 Ga. & Lighter)			
ChicagoHts.(3) C2, I-2.4.20				
ChicagoHts.(4) C2, I-2.4.30				
Ft.Worth,Tex.(26) T4 4.75				
Franklin,Pa.(3) F5 4.20				
Franklin,Pa.(4) F5 4.30				
Marion,O.(3) P11 4.20				
Moline,Ill(3) R2 4.30				
Tonawanda(3) B12 4.15				
Tonawanda(4) B12 4.30				
Williamsport,Pa.(3) S19.4.30				
BARS, Wrought Iron				
Economy,Pa.(S.R.) B14 10.85	SHEETS, H.R. Alloy			
Economy,Pa.(D.R.) B14 13.50				
Economy(Staybolt) B14 13.80				
McK.Rks(S.R.) L5 10.85				
McK.Rks(D.R.) L5 14.75				
McK.Rks(Staybolt) L5 16.25				
A1 Acme Steel Co.	SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy			
A3 Alan Wood Steel Co.				
A4 Allegheny Ludlum Steel				
A5 Alloy Metal Wire Co.				
A6 American Shim Steel Co.				
A7 American Steel & Wire				
A8 Anchor Drawn Steel Co.				
A9 Angell Nail & Chaplet				
A10 Armclo Steel Corp.				
A11 Atlantic Steel Co.				
B1 Babcock & Wilcox Co.	D2 Detroit Steel Corp.	I-6 Ivins, E., Steel Tube	N16 New Delphos Mfg. Co.	
B2 Bethlehem Steel Co.	D3 Detroit Tube & Steel	I-7 Indiana Steel & Wire Co.	N19 Northeastern Steel Corp.	
B3 Beth. Pac. Coast Steel	D4 Distson & Sons, Henry	J1 Jackson Iron & Steel Co.	O3 Oliver Iron & Steel Corp.	
B4 Blair Strip Steel Co.	D6 Driver Harris Co.	J3 Jessop Steel Co.	O4 Oregon Steel Mills	
B5 Bliss & Laughlin Inc.	D7 Dickson Weatherproof	J4 Johnson Steel & Wire Co.	P1 Pacific States Steel Corp.	
B8 Braeburn Alloy Steel	D8 Damascus Tube Co.	J5 Jones & Laughlin Steel	P2 Pacific Tube Co.	
B9 Brainard Steel Div.,	D9 Wilbur B. Driver Co.	J6 Joslyn Mfg. & Supply	P4 Phoenix Iron & Steel Co.	
Sharon Steel Corp.		J7 Judson Steel Corp.	P5 Pilgrim Drawn Steel	
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron	E1 Eastern Gas & Fuel Assoc.	J8 Jersey Shore Steel Co.	P6 Pittsburgh Coke & Chem.	
B11 Buffalo Bolt Co., Div. Buffalo-Eclipse Corp.	E2 Eastern Stainless Steel	K1 Kaiser Steel Corp.	P7 Pittsburgh Steel Co.	
B12 Buffalo Steel Corp.	E4 Electro Metallurgical Co.	K2 Keokuk Electro-Metals	P11 Pollak Steel Co.	
B14 A. M. Byers Co.	E5 Elliott Bros. Steel Co.	K3 Keystone Drawn Steel	P12 Portsmouth Division	
B15 J. Bishop & Co.	E6 Empire Steel Corp.	K4 Keystone Steel & Wire	Detroit Steel Corp.	
C1 Calstrip Steel Corp.	F2 Firth Sterling Inc.	K7 Kenmore Metals Corp.	P13 Precision Drawn Steel	
C2 Colum't Steel Div., Borg-Warner Corp.	F3 Fitzsimons Steel Co.	L1 Laclede Steel Co.	P14 Pitts. Screw & Bolt Co.	
C4 Carpenter Steel Co.	F4 Follansbee Steel Corp.	L2 LaSalle Steel Co.	P15 Pittsburgh Metallurgical	
C5 Central Iron & Steel Div., Barium Steel Corp.	F5 Franklin Steel Div.,	L3 Latrobe Steel Co.	P16 Pipe Steel & Wire Div., Amer. Chain & Cable	
C7 Cleve. Cold Rolling Mills	F6 Fretz-Moon Tube Co.	L5 Lockhart Iron & Steel	P17 Plymouth Steel Co.	
C8 Cold Metal Products Co.	F7 Ft. Howard Steel & Wire	L6 Lone Star Steel Co.	P19 Pitts. Rolling Mills	
C9 Colonial Steel Co.	F8 Ft. Wayne Metals Inc.	L7 Lukens Steel Co.	P20 Prod. Steel Strip Corp.	
C10 Colorado Fuel & Iron	G2 Globe Iron Co.	M1 McLouth Steel Corp.	P23 Pacific Steel Rolling	
C11 Columbia-Geneva Steel	G4 Granite City Steel Co.	M4 Mahoning Valley Steel	R1 Reeves Steel & Mfg. Co.	
C12 Columbia Steel & Shaft.	G5 Great Lakes Steel Corp.	M6 Mercer Pipe Div., Sawhill Tubular Products	R2 Republic Steel Corp.	
C14 Compressed Steel Shaft.	G6 Greer Steel Co.	M8 Mid-States Steel & Wire	R3 Rhode Island Steel Corp.	
C15 Connors Steel Div., H. K. Porter Co. Inc.	H1 Hanna Furnace Corp.	M12 Moltrup Steel Products	R5 Roebling's Sons, John A.	
C16 Continental Steel Corp.	H7 Helical Tube Co.	M13 Monarch Steel Div., Jones & Laughlin Steel Corp.	R6 Rome Strip Steel Co.	
C17 Copperweld Steel Co.	I-1 Igoe Bros. Inc.	M14 McInnes Steel Co.	R7 Rotary Electric Steel Co.	
C18 Crucible Steel Co.	I-2 Inland Steel Co.	M16 Md. Fine & Special, Wire	R8 RelianceDiv., EatonMfg.	
	I-3 Interlake Iron Corp.	M17 Metal Forming Corp.	R9 Rome Mfg. Co.	
	I-4 Ingersoll Steel Div., Borg-Warner Corp.	M18 Milton Steel Prod. Div., Merritt-Chapman & Scott	R10 Rodney Metals Inc.	
		N1 National-Standard Co.	S1 Seneca Wire & Mfg. Co.	
		N2 National Supply Co.	S3 Sharon Steel Corp.	
		N3 National Tube Div.	S4 Sharon Tube Co.	
		N5 Nelsen Steel & Wire Co.	S5 Sheffield Steel Div., Armco Steel Corp.	
		N6 NewEng. High Carb. Wire	S6 Shenango Furnace Co.	
		N8 Newman-Crosby Steel	S7 Simmons Co.	
		N9 Newport Steel Corp.	S8 Simonds Saw & Steel Co.	
		N12 Niles Rolling Mill Div.	S12 Spencer Wire Corp.	
		N14 NorthWest Steel Roll.Mills	S13 Standard Forgings Corp.	
		N15 Northwestern S.&W. Co.	S14 Standard Tube Co.	
			S15 Stanley Works	
			S17 Superior Drawn Steel Co.	
			S18 Superior Steel Corp.	

Key to Producers

A1 Acme Steel Co.	C19 Cumberland Steel Co.	I-6 Ivins, E., Steel Tube	N16 New Delphos Mfg. Co.
A3 Alan Wood Steel Co.	C20 Cuyahoga Steel & Wire	I-7 Indiana Steel & Wire Co.	N19 Northeastern Steel Corp.
A4 Allegheny Ludlum Steel	C22 Claymont Steel Products	J1 Jackson Iron & Steel Co.	O3 Oliver Iron & Steel Corp.
A5 Alloy Metal Wire Co.	Dept. Wickwire Spencer	J3 Jessop Steel Co.	O4 Oregon Steel Mills
A6 American Shim Steel Co.	Steel Division	J4 Johnson Steel & Wire Co.	P1 Pacific States Steel Corp.
A7 American Steel & Wire	C23 Charter Wire Inc.	J5 Jones & Laughlin Steel	P2 Pacific Tube Co.
A8 Anchor Drawn Steel Co.	C24 G. O. Carlson Inc.	J6 Joslyn Mfg. & Supply	P4 Phoenix Iron & Steel Co.
A9 Angell Nail & Chaplet	C31 Chester Blast Furnace	J7 Judson Steel Corp.	P5 Pilgrim Drawn Steel
A10 Armclo Steel Corp.	Inc.	J8 Jersey Shore Steel Co.	P6 Pittsburgh Coke & Chem.
A11 Atlantic Steel Co.		K1 Kaiser Steel Corp.	P7 Pittsburgh Steel Co.
B1 Babcock & Wilcox Co.	D2 Detroit Steel Corp.	K2 Keokuk Electro-Metals	P11 Pollak Steel Co.
B2 Bethlehem Steel Co.	D3 Detroit Tube & Steel	K3 Keystone Drawn Steel	P12 Portsmouth Division
B3 Beth. Pac. Coast Steel	D4 Distson & Sons, Henry	K4 Keystone Steel & Wire	Detroit Steel Corp.
B4 Blair Strip Steel Co.	D6 Driver Harris Co.	K7 Kenmore Metals Corp.	P13 Precision Drawn Steel
B5 Bliss & Laughlin Inc.	D7 Dickson Weatherproof	L1 Laclede Steel Co.	P14 Pitts. Screw & Bolt Co.
B8 Braeburn Alloy Steel	Nal Co.	L2 LaSalle Steel Co.	P15 Pittsburgh Metallurgical
B9 Brainard Steel Div.,	D8 Damascus Tube Co.	L3 Latrobe Steel Co.	P16 Pipe Steel & Wire Div., Amer. Chain & Cable
Sharon Steel Corp.	D9 Wilbur B. Driver Co.	L5 Lockhart Iron & Steel	P17 Plymouth Steel Co.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron	E1 Eastern Gas & Fuel Assoc.	L6 Lone Star Steel Co.	P19 Pitts. Rolling Mills
B11 Buffalo Bolt Co., Div. Buffalo-Eclipse Corp.	E2 Eastern Stainless Steel	L7 Lukens Steel Co.	P20 Prod. Steel Strip Corp.
B12 Buffalo Steel Corp.	E4 Electro Metallurgical Co.	M1 McLouth Steel Corp.	P23 Pacific Steel Rolling
B14 A. M. Byers Co.	E5 Elliott Bros. Steel Co.	M4 Mahoning Valley Steel	R1 Reeves Steel & Mfg. Co.
B15 J. Bishop & Co.	E6 Empire Steel Corp.	M6 Mercer Pipe Div., Sawhill Tubular Products	R2 Republic Steel Corp.
C1 Calstrip Steel Corp.	F2 Firth Sterling Inc.	M8 Mid-States Steel & Wire	R3 Rhode Island Steel Corp.
C2 Colum't Steel Div., Borg-Warner Corp.	F3 Fitzsimons Steel Co.	M12 Moltrup Steel Products	R5 Roebling's Sons, John A.
C4 Carpenter Steel Co.	F4 Follansbee Steel Corp.	M13 Monarch Steel Div., Jones & Laughlin Steel Corp.	R6 Rome Strip Steel Co.
C5 Central Iron & Steel Div., Barium Steel Corp.	F5 Franklin Steel Div.,	M14 McInnes Steel Co.	R7 Rotary Electric Steel Co.
C7 Cleve. Cold Rolling Mills	F6 Fretz-Moon Tube Co.	M16 Md. Fine & Special, Wire	R8 RelianceDiv., EatonMfg.
C8 Cold Metal Products Co.	F7 Ft. Howard Steel & Wire	M17 Metal Forming Corp.	R9 Rome Mfg. Co.
C9 Colonial Steel Co.	F8 Ft. Wayne Metals Inc.	M18 Milton Steel Prod. Div., Merritt-Chapman & Scott	R10 Rodney Metals Inc.
C10 Colorado Fuel & Iron	G2 Globe Iron Co.	N1 National-Standard Co.	S1 Seneca Wire & Mfg. Co.
C11 Columbia-Geneva Steel	G4 Granite City Steel Co.	N2 National Supply Co.	S3 Sharon Steel Corp.
C12 Columbia Steel & Shaft.	G5 Great Lakes Steel Corp.	N3 National Tube Div.	S4 Sharon Tube Co.
C14 Compressed Steel Shaft.	G6 Greer Steel Co.	N5 Nelsen Steel & Wire Co.	S5 Sheffield Steel Div., Armco Steel Corp.
C15 Connors Steel Div., H. K. Porter Co. Inc.	H1 Hanna Furnace Corp.	N6 NewEng. High Carb. Wire	S6 Shenango Furnace Co.
C16 Continental Steel Corp.	H7 Helical Tube Co.	N8 Newman-Crosby Steel	S7 Simmons Co.
C17 Copperweld Steel Co.	I-1 Igoe Bros. Inc.	N9 Newport Steel Corp.	S8 Simonds Saw & Steel Co.
C18 Crucible Steel Co.	I-2 Inland Steel Co.	N12 Niles Rolling Mill Div.	S12 Spencer Wire Corp.
	I-3 Interlake Iron Corp.	N14 NorthWest Steel Roll.Mills	S13 Standard Forgings Corp.
	I-4 Ingersoll Steel Div., Borg-Warner Corp.	N15 Northwestern S.&W. Co.	S14 Standard Tube Co.
			S15 Stanley Works
			S17 Superior Drawn Steel Co.
			S18 Superior Steel Corp.

STRIP

STRIP, Hot-Rolled Carbon

Ala. City, Ala. (27) R2	4.05	Riverdale, Ill. A1	5.85	Pittsburgh J5	8.60
Allenport, Pa. P7	4.05	Sharon, Pa. S3	5.75	Sharon, Pa. S3	8.60
Alton, Ill. L1	4.225	SparrowsPoint, Md. B2	5.75	SparrowsPoint, Md. B2	8.425
Ashland, Ky. (8) A10	4.05	Trenton, N.J. (31) R5	7.30	Warren, O. R2	8.60
Atlanta A11	4.25	Wallingford, Conn. W2	6.20	Weirton, W.Va. W6	8.60
Bessemer, Ala. T2	4.05	Warren, O. B9, R2, T5	5.75	Youngstown Y1	8.60
Birmingham, C15	4.05	Carnegie, Pa. S18	12.45	STRIP, Cold-Rolled Ingot Iron	
Bridgeport, Conn. N19	4.35	Cleveland A7	12.45	Warren, O. R2	6.35
Buffalo (27) P2	4.05	Dover, O. G6	12.45	STRIP, Electrogalvanized	
Conshohocken, Pa. A3	4.10	Riverdale, Ill. A1	5.85*	Cleveland A7	5.75*
Detroit M1	4.15	Youngstown C8	5.75*	Dover, O. G6	5.75*
Ecorse, Mich. G5	4.15	Warren, O. B9, T5	5.75*	Riverdale, Ill. A1	5.85*
Fairfield, Ala. T2	4.05	Weirton, W.Va. W6	5.75*	Youngstown C8	5.75*
Fontana, Calif. K1	4.825	FranklinPark, Ill. T6	12.45	Warren, O. B9	5.75*
Gary, Ind. U5	4.05	Harrison, N.J. C18	12.45	Worcester, Mass. A7	6.60*
Ind. Harbor, Ind. I-2, Y1	4.05	Pawtucket, R.I. N8	12.80	*Plus galvanizing extras.	
Johnstown, Pa. (25) B2	4.05	Sharon, Pa. S3	12.45	Strip, Galvanized	
Lackawanna, N.Y. (25) B2	4.05	Sharon, Pa. S3	12.45	(Continuous)	
Los Angeles (25) B3	4.05	Sharon, Pa. S3	12.75	Sharon, Pa. S3	6.15
Milton, Pa. M18	4.05	Sharon, Pa. S3	12.90	TIGHT COOPERAGE HOOP	
Minnequa, Colo. C10	5.15	Sharon, Pa. S3	6.15	Atlanta A11	4.775
N. Tonawanda, N.Y. B11	4.05	Dover, O. G6	8.60	Riverdale, Ill. A1	4.625
Pittsburg, Calif. C11	4.80	FranklinPark, Ill. T6	8.70	Sharon, Pa. S3	4.475
Portsmouth, O. P12	4.05	Harrison, N.J. C18	8.70	Youngstown U5	4.475
Riverdale, Ill. A1	4.05	Pawtucket, R.I. N8	8.80		
San Francisco S7	5.00	Sharon, Pa. S3	8.80		
Seattle (25) B3, P23	5.05	Sharon, Pa. S3	8.80		
Seattle N14	5.05	Sharon, Pa. S3	8.80		
Sharon, Pa. S3	4.05	Sharon, Pa. S3	8.80		
So. Chicago, Ill. W14	4.05	Sharon, Pa. S3	8.80		
So. San Francisco (25) B3	4.80	Sharon, Pa. S3	8.80		
SparrowsPoint, Md. B2	4.05	Sharon, Pa. S3	8.80		
Sterling (1) N15	4.05	Sharon, Pa. S3	8.80		
Sterling, Ill. N15	4.15	Sharon, Pa. S3	8.80		
Torrance, Calif. C11	4.80	Sharon, Pa. S3	8.80		
Warren, O. R2	4.05	Sharon, Pa. S3	8.80		
Weirton, W.Va. W6	4.05	Sharon, Pa. S3	8.80		
Youngstown U5	4.05	Sharon, Pa. S3	8.80		

STRIP, Hot-Rolled Alloy

Bridgeport, Conn. N19	7.00
Carnegie, Pa. S18	6.70
Fontana, Calif. K1	8.10
Gary, Ind. U5	6.70
Ind. Harbor, Ind. Y1	6.70
Los Angeles B3	7.90
Newport, Ky. N9	6.70
Seattle P23	7.80
Sharon, Pa. S3	6.70
So. Chicago W14	6.70
Youngstown U5, Y1	6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer, Ala. T2	6.15
Conshohocken, Pa. A3	6.15
Ecorse, Mich. G5	6.25
Fairfield, Ala. T2	6.15
Fontana, Calif. K1	7.25
Gary, Ind. U5	6.15
Houston S5	6.40
Ind. Harbor, Ind. I-2, Y1	6.15
Kansas City, Mo. S5	6.40
Lackawanna, N.Y. B2	6.15
Los Angeles (25) B3	6.90
Seattle (25) B3, P23	7.15
Sharon, Pa. S3	6.15
So. San Francisco (25) B3	6.90
SparrowsPoint, Md. B2	6.15
Warren, O. R2	6.15
Weirton, W.Va. W6	6.15
Youngstown U5, Y1	6.15

STRIP, Hot-Rolled Ingot Iron

Ashland, Ky. (8) A10	4.30
Warren, O. R2	4.65

STRIP, Cold-Rolled Carbon

Anderson, Ind. G6	5.75
Baltimore T6	5.75
Cleveland A7, J5	5.75
Conshohocken, Pa. A3	5.75
Dearborn, Mich. D3	5.85
Detroit D2, M1, P20	5.85
Dover, O. G6	5.75
Ecorse, Mich. G5	5.85
Fairfield, Ala. T2	6.15
Fontana, Calif. K1	7.50
Franklin Park, Ill. T6	5.85
Ind. Harbor, Ind. I-2	5.85
Indianapolis C8	5.75
Ind. Harbor, Ind. I-2, Y1	5.85
Kansas City, Mo. S5	6.40
Lackawanna, N.Y. B2	6.15
Los Angeles (25) B3	6.90
Seattle (25) B3, P23	7.15
Sharon, Pa. S3	6.15
So. San Francisco (25) B3	6.90
SparrowsPoint, Md. B2	6.15
Warren, O. R2	6.15
Weirton, W.Va. W6	6.15
Youngstown U5, Y1	6.15

STRIP, Cold-Rolled Alloy

Bridgeport, Conn. N19	7.00
Carnegie, Pa. S18	6.70
Fontana, Calif. K1	8.10
Gary, Ind. U5	6.70
Ind. Harbor, Ind. Y1	6.70
Los Angeles B3	7.90
New Haven, Conn. D2	6.20
New Kensington, Pa. A6	5.75
New York W3	6.30
Seattle P23	7.80
Sharon, Pa. S3	6.70
So. Chicago W14	6.70
Youngstown U5, Y1	6.70

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Arma-ture	Electric	Dyno-motor
BeechBotttom, W.Va. W10	12.90	15.60	...
Brackenridge, Pa. A4	12.90	15.60	...
Mansfield, O. E6	8.025	8.50	9.10
Newport, Ky. N9	8.025	8.50	9.10
Niles, O. N12	8.025	8.50	9.10
Vandergrift, Pa. U5	8.50	9.10	10.10
Warren, O. R2	8.025	8.50	9.10
Zanesville, O. A10	8.50	9.10	10.10

C.R. COILS & CUT LENGTHS, (22 Ga.)

(Semiprocessed 1/2 lower)	Arma-ture	Electric	Dyno-motor
BeechBotttom, W.Va. W10	9.10	10.10	11.00
Brackenridge, Pa. A4	9.10	10.10	11.00
GraniteCity, Ill. G4	9.425*	9.95*	9.55*
IndianaHarbor, Ind. I-2	8.225	8.75*	9.35*
Vandergrift, Pa. U5	9.251*	9.85*	10.851*
Vandergrift, Pa. U5	8.225*	8.75*	10.35*
Warren, O. R2	8.225*	9.25	9.85
Zanesville, O. A10	9.25	9.85	10.85

C.R. COILS & CUT LENGTHS (22 Ga.)

(22 Ga.)	Transformer Grade	T-72	T-65	T-58	T-52
BeechBotttom, W.Va. W10	11.95	12.50	13.00	14.00	...
Brackenridge, Pa. A4	11.95	...	...	...	...
Newport, Ky. N9	11.95	...	...	...	...
Vandergrift, Pa. U5	11.95	12.50	13.00	14.00	...
Zanesville, O. A10	11.95*	12.50*	13.00	14.00	...

Grain Oriented

T-100	T-90	T-80	T-70	T-72
15.00	16.60	17.10	...	...
16.60	17.10	...	...	...
14.00	15.00	16.60	17.10	12.70
12.70	...	...	...	...

*Semiprocessed. †Fully processed only. ‡Coils annealed.

semiprocessed 1/2 lower. §Coils, % cent higher.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)

0.25 lb	0.50 lb	0.75 lb
Aliquippa, Pa. J5	\$7.50	\$7.75
Dravosburg, Pa. U5	7.50	7.75
Fairfield, Ala. T2	7.60	7.85
FairlessHills, Pa. U5	7.60	7.85
Gary, Ind. U5	7.50	7.75
GraniteCity, Ill. G4	7.60	7.85
Weirton, W.Va. W6	7.50	7.75
Yorkville, O. W10	7.50	7.75

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa, Pa. J5	6.175
Niles, O. R2	6.175
TINPLATE, American 1.25 Coke (Base Box)	1.50
Weirton, W.Va. W6	6.60
Yorkville, O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg, Pa. U5	8.2
Follansbee, W.Va. F4	6.2
Gary, Ind. U5	6.2
Ind. Har. I-2, Y1	6.2
Ind. Harbor, Ind. Y1	6.2

MANUFACTURING TERNES (Special Coated; Base Box)

BLACK PLATE (Base Box)	1.50
Alquippa, Pa. J5	\$6.60
Dravosburg, Pa. U5	6.60
Gary, Ind. U5	6.60
Yorkville, O. W10	6.60

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

ROOFING SHORT TERNES (8 lb Coated)	1.50
Alquippa, Pa. J5	9.8
Buffalo W12	6.9
Cleveland A7	6.9
Donora, Pa. A7	6.9
Duluth, Minn. A7	6.9
Fairfield, Ala. T2	6.70
FairlessHills, Pa. U5	6.70
Gary, Ind. U5	6.60
GraniteCity, Ill. G4	6.70
Ind. Har. I-2, Y1	6.60
KansasCity, Mo. S5	7.5
Atlanta A11	5.95
Bartontonville, Ill. K4	5.85
Buffalo W12	5.75
Chicago W13	5.75
Cleveland A7, C20	5.75
Crawfordsville, Ind. M8	5.85
Duluth, Minn. A7	5.75
Fairfield, Ala. T2	5.75
Foster, O. III, R2	5.75
Globe, N.J. R5	7.2
Monessen, Pa. P7	16.60
Portsmouth, O. P12	6.9
Roebeling, N.J. R5	11.3
So. San Francisco C10	7.8
Waukegan, Ill. A7	6.9
Worcester, Mass. A7	7.2

WIRE, Fine & Weaving (8) Coil

Alton

WIRE

(Continued)

WIRE, Tire Bead

Alton, Ill.	L1	13.25	Bartonville, Ill.	K4	164
Bartonville, Ill.	K4	13.25	Crawfordsville, Ind.	M8	164
Monessen, Pa.	P16	13.15	Donora, Pa.	A7	1591
Portsmouth, O.	P12	13.15	Duluth, Minn.	M11	1591
Roebling, N.J.	R5	13.45	Fairfield, Ala.	T2	1591
WIRE, Cold-Rolled Flat			Houston, Tex.	S5	1591
Anderson, Ind.	G6	7.95	Kansas City, Mo.	S5	164
Baltimore	T6	8.25	Kokomo, Ind.	C16	1611
Buffalo	W12	7.95	Minnequa, Colo.	C10	164
Cleveland	A7	7.95	Monessen, Pa.	P7	162
Crawfordsville, Ind.	M8	8.05	Pittsburg, Calif.	C11	1791
Dover, O.	G6	7.95	Rankin, Pa.	A7	1591
Fostoria, O.	S1	7.95	So. Chicago, Ill.	R2	159*
Franklin Park, Ill.	T6	8.05	Sparsows Point, Md.	B2	164
Kokomo, Ind.	C16	8.05	Sterling, Ill. (1)	N15	162
Massillon, O.	R8	7.95	Tire Boits		15
Milwaukee	C23	8.15	Boiler & Fitting-Up Bolts		21
Monessen, Pa.	P7	7.95			
Pawtucket, R.I.	NS	8.25			
Rome, N.Y. (32)	R6	7.95			
Trenton, N.J.	R5	8.25			
Worcester	A7, T6, W12	8.25			

**WIRE, Merchant Quality
(6 to 8 gage) An'ld Galv.**

Ala. City, Ala.	R2	6.90	7.30*
Aliquippa	J5	6.90	7.425\$
Atlanta	A11	7.00	7.55
Bartonville (48)	K4	7.00	7.55
Buffalo	W12	6.90	7.30†
Cleveland	A7	6.90	7.30†
Crawfordsville	M8	7.00	7.55
Donora, Pa.	A7	6.90	7.30†
Duluth, Minn.	A7	6.90	7.30†
Fairfield, Tex.	T2	6.90	7.30†
Houston, Tex.	S5	7.18	7.55†
Jacks'ville, Fla.	M8	7.425	7.95
Johnstown B2 (48)	K4	7.00	7.45*
Joliet, Ill.	A7	6.90	7.30†
Kansas City, Mo.	S5	7.15	7.55†
Kokomo	C16	7.00	7.40†
Los Angeles	B3	7.85	....
Minnequa	C10	7.15	7.55**
Monessen	P7	6.90	7.45
Palmer, Mass.	W12	7.20	7.60†
Pitts., Calif.	C11	7.85	8.25†
Portsmouth, O.	P12	6.90	7.30†
Rankin, A7	6.90	7.30†	
So. Chicago	R2	6.90	7.30*
So. S. Fran.	C10	7.85	8.25**
Sparrows Pt. (B2) (48)	A9	7.00	7.55*
Sterling, Ill. (48) N15	R2	6.90	7.45
Struthers, O.	(Y)1	6.90	7.40†
Worcester, Mass.	A7	7.20	....

*Based on 11c zinc; †5c zinc; ‡Less than 10c zinc;
Subject to zinc equalization extras.WOVEN Fence, 9-15½ Ga. Col.**

Ala. City, Ala.	R2	148**	
Ala. City,	17 ga.	R2	241**
Ala. City,	18 ga.	R2	251**
Ali'ppa, Pa.	9-14½ ga.	J5	149\$
Atlanta	A11	151	
Bartonville, Ill.	K4	151	
Crawfordsville, Ind.	M8	151	
Donora, Pa.	A7	146†	
Duluth, Minn.	A7	146†	
Fairfield, Ala.	T2	146†	
Houston, Tex.	S5	151†	
Johnstown, Pa.	(43) B2	149	
Joliet, Ill.	A7	146†	
Kansas City, Mo.	S5	151†	
Kokomo, Ind.	C16	148†	
Minnequa, Colo.	C10	151†	
Monessen, Pa.	P7	149	
Pittsburgh, Calif.	C11	169†	
Rankin, Pa.	A7	146†	
So. Chicago, Ill.	R2	146**	
Sterling, Ill. (1) N15	R2	149	

†Based on 5c zinc; †11c zinc; ‡10c zinc; **Subject to zinc equalization extras.

BALE TIES, Single Loop Col.

Alabama City, Ala.	R2	155
Atlanta	A11	157
Bartonville, Ill.	K4	157
Crawfordsville, Ind.	M8	157
Donora, Pa.	A7	155
Duluth, Minn.	A7	155
Fairfield, Ala.	T2	155
Joliet, Ill.	A7	155
Kansas City, Mo.	S5	160
Kokomo, Ind.	C16	157
Minnequa, Colo.	C10	160
Monessen, Pa.	P7	157
Pittsburgh, Calif.	C11	179
So. Chicago, Ill.	R2	155
Sparrows Point, Md.	B2	157
Sterling, Ill. (1) N15	R2	155

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**
Tonawanda, N.Y.	B12	150
Aliquippa	J5	1565
Williamsport, Pa.	S19	150

WIRE, Barbed Col.

Alabama City, Ala.	R2	159**

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SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %									
Size—Inches	2	2½	3	3½	4	5	6		
List Per Ft	37c	58.5c	76.5c	92c	\$1.09	\$1.48	\$1.92		
Pounds Per Ft	3.68	5.82	7.62	9.20	10.89	14.81	19.18		
Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*
Aliquippa, Pa. J5	13.5 + 3	17.5 + 0.25	20	2.25	21.5	3.75	20.75	3	23.25
Ambridge, Pa. N2	13.5 ..	17.5 ..	20	..	21.5 ..	21.5 ..	20.75 ..	..	23.25 ..
Lorain, O. N3	13.5 + 3	17.5 + 0.25	20	2.25	21.5	3.75	21.5	3.75	20.75 ..
Youngstown Y1	13.5 + 3	17.5 + 0.25	20	2.25	21.5	3.75	20.75	3	23.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %									
Youngstown R2	13.5 + 3	17.5 + 0.25	20	2.25	21.5	3.75	21.5	3.75	20.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %									
Size—Inches	½	¼	%	½	%	1	1¼		
List Per Ft	5.5c	6c	6c	8.5c	11.5c	17c	23c		
Pounds Per Ft	0.24	0.42	0.57	0.85	1.13	1.68	2.28		
Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*
Aliquippa, Pa. J5	..	..	..	23.75	6.5	26.75	10.5	29.25	14
Alton, Ill. L1	..	..	..	21.75	4.5	24.75	8.5	27.25	12
Benwood, W. Va. W10	24	+ 4.5	15.25 + 10.25	7.25 + 17.25	23.75	6.5	26.75	10.5	29.25
Butler, Pa. F6	25	+ 3.5	17 + 8.5	9.5 + 15	..	..	..	..	..
Etna, Pa. N2	..	..	..	23.75	6.5	26.75	10.5	29.25	14
Fairless Hills, Pa. N3	..	..	..	21.75	4.5	24.75	8.5	27.25	12
Fontana, Calif. K1	..	..	..	10.75 + 6.5	13.75 + 2.5	16.25	1	18.75	2.25
Ind. Harbor, Ind. Y1	..	..	..	22.75	5.5	25.75	9.5	28.25	13
Lorain, O. N3	..	..	..	23.75	6.5	26.75	10.5	29.25	14
Sharon, Pa. S4	25	+ 3.5	17 + 8.5	9.5 + 15	..	..	..	..	..
Sharon, Pa. M6	..	..	..	23.75	6.5	26.75	10.5	29.25	14
Sparrows Pt., Md. B2	23	+ 5.5	15 + 10.5	7.5 + 17	21.75	4.5	24.75	8.5	27.25
Youngstown R2, Y1	..	..	..	23.75	6.5	26.75	10.5	29.25	14
Wheatland, Pa. W9	23	+ 5.5	15 + 10.5	7.5 + 17	23.75	6.5	26.75	10.5	29.25

Size—Inches									
List Per Ft		Pounds Per Ft		Blk Galv*		Blk Galv*		Blk Galv*	
27.5c	2.73	37c	3.68	58.5c	5.82	76.5c	7.62	92c	\$1.09
									10.89
Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*	Blk Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	..
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	..
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5 7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5 7.75
Fairless Hills, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5 5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5 + 5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5 6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	..
Sharon, Pa. M6	32.25	16.25	32.75	16.75	34.25	17	34.25	17	..
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5 5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5 7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5 7.75

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Shapes; H.R. & C.F.				C.R. Strip; Flat Wire	Stainless:	Plates—Carbon Base		Sheets—Carbon Base 20%
				Seamless Tube Billets	H.R. Strip	Bars; Wire	Plates Sheets			10%	20%	
301	16.75	21.00	30.00	34.75	30.25	35.75	37.75	41.75	38.75	304	23.30	33.60
302	17.75	23.25	30.25	35.00	32.50	36.00	38.00	42.00	42.00	304-L	30.30	35.50
302B	19.00	25.00	31.00	35.00	35.50	36.00	38.00	45.25	45.25	316	33.40	38.80
303	..	25.25	32.75	37.75	..	38.75	40.25	46.00	46.00	316-L	37.80	43.30
304	19.00	24.50	31.75	36.75	35.00	38.00	40.50	44.50	44.50	321	30.00	35.30
304L	..	..	36.75	41.75	40.00	43.00	45.50	49.50	49.50	347	32.20	38.60
305	20.50	26.50	33.50	37.25	38.00	38.00	41.00	47.50	47.50	405	23.90	31.10
308	20.75	27.25	36.25	41.75	39.00	43.00	47.00	49.00	49.00	430	23.40	30.60
309	27.75	36.00	44.00	50.50	50.50	51.75	55.00	63.25	63.25	Inconel	47.90	63.90
309S	29.75	38.75	48.00	55.75	55.25	56.75	60.25	69.75	69.75	Nickel	39.50	54.10
310	35.00	45.25	58.75	68.25	64.75	69.50	71.00	74.25	74.25	Monel	40.80	54.80
314	..	..	..	..	..	..	71.00	..	..	L-Nickel	41.70	58.50
316	29.75	38.00	48.25	56.25	55.00	57.25	60.50	64.50	64.50	Copper*	..	46.00
316L	..	..	53.25	61.25	60.00	62.25	65.50	69.50	69.50			
317	35.00	45.50	59.25	68.75	69.50	70.25	72.75	79.00	79.00	Strip, Carbon Base Cold-Rolled	10%	Both Side
321	23.50	30.25	36.00	41.50	41.75	42.75	46.50	51.25	51.25	Copper*	26.00	32.00
330	..	..	61.50	..	..	72.00	73.25	81.25	81.25			
18-8CbTa	29.25	38.25	46.00	52.25	53.00	53.75	58.50	66.50	66.50			
403	..	..	27.00	30.75	..	32.00	34.25	..	..	
405	..	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75			
410	..	14.00	18.25	24.00	27.25	28.75	30.00	34.25	34.25			
414	..	..	..	24.50	..	29.25	30.50	35.25	35.25			
416	..	..	..	24.50	28.25	29.25	..	..	..
420	..	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75		
430	..	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75		
430F	..	..	..	25.00	28.75	..	29.75	..	..	
431	..	15.00	19.25	25.00	28.75	28.00	29.75	..	35.75	35.75		
446	..	..	..	33.50	38.25	50.25	39.50	40.75	59.75	59.75		

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armcro Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Irvins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div.; Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co., Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulrich Stainless Steels; United States Steel Corp.; Universal Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Grade	\$ per lb	Grade	\$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.40
Extra Carbon	0.31-0.35	W-Cr Hot Work	0.42
Special Carbon	0.37	V-Cr Hot Work	0.44
Oil Hardening	0.405	Hi-Carbon-Cr	0.7

Grade by Analysis (%)	W	Cr	V	Co	Mo	\$ per lb
20.25	4.25	1.6	12.25	..	..	4.03
18.25	4.25	1	4.75	..	..	2.245-2.41
18	4	2	9	..	..	2.61
18	4	2	1	..	..	1.70
18	4	1	..	..	..	1.54
14	4	2	5	..	..	2.18
13.75	3.75	2	5	..	..	2.18
13.5	4	3	..	..	..	1.80
9	3.5	..	..	..	..	1.11
6	4	2	5	..	..	1.04
6	4	3	..	6	..	1.29
1.5	4	1	..	..	..	0.90

Tool steel producers include: A4, A8, B2, B8, C4, C5, C13, C18, D4, F2, J3, I3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	No. 2 Basic	Malleable Foundry	Bessemer		No. 2 Basic	Malleable Foundry	Bessemer
Birmingham District				Youngstown District			
Alabama City, Ala. R2	52.38	52.88	....	Hubbard, O. Y1	....	56.50	....
Birmingham R2	52.38	52.88	....	Sharpsville, Pa. S6	56.00	56.50	56.50
Birmingham U6	....	52.88	56.50†	Youngstown Y1	....	56.50	57.00
Gadsden, Ala. R2	52.38	52.88	....	Youngstown U5	56.00	....	57.00
Cincinnati, deld.	....	60.58	....	Mansfield, O. deld.	60.90	....	61.40
Buffalo District				Duluth I-3	56.00	56.50	56.50
Buffalo H1, R2	56.00	56.50	57.00	Erie, Pa. I-3	56.00	56.50	56.50
Tonawanda, N.Y. W12	56.00	56.50	57.00	Everett, Mass. E1	60.50	61.00	61.50
No. Tonawanda, N.Y. T9	....	56.50	57.00	Fontana, Calif. K1	62.00	62.50	....
Boston, deld.	66.65	67.15	67.65	Geneva, Utah C1J	56.00	56.50	....
Rochester, N.Y., deld.	59.02	59.52	60.02	Granite City, Ill. G4	57.90	58.40	58.90
Syracuse, N.Y., deld.	60.12	60.62	61.12	Ironton, Utah C1L	56.00	56.50	....
Chicago District				Lone Star, Texas L6	52.00	52.50*	52.50
Chicago I-3	56.00	56.50	56.50	Minnequa, Colo. C10	58.00	59.00	59.00
Chicago R2	56.00	....	56.50	Rockwood, Tenn. T2	....	52.50*	56.50
Gary, Ind. U5	56.00	....	56.50	Teddy, O. I-3	56.00	56.50	56.50
Indiana Harbor, Ind. I-2	56.00	....	56.50	Cincinnati, deld.	61.76	62.26	....
So. Chicago, Ill. W14, Y1	56.00	56.50	56.50				
So. Chicago, Ill. U5	56.00	....	56.50				
Milwaukee, deld.	58.17	58.67	58.67				
Muskegon, Mich., deld.	....	62.80	62.80				
Cleveland District							
Cleveland A7, R2	56.00	56.50	56.50				
Akron, O. deld.	58.75	59.25	59.25				
Lorain, O. N3	56.00	....	57.00				
Mid-Atlantic District							
Bethlehem, Pa. B2	58.00	58.50	59.00				
New York, deld.	62.28	62.78	....			
Newark, deld.	61.02	61.52	62.02				
Birdsboro, Pa. B10	58.00	58.50	....			
Chester, Pa. C31	....	48.50	49.00				
Philadelphia, deld.	50.16	50.68	....			
Steeltown, Pa. B2	58.00	58.50	59.00				
Swedenland, Pa. A3	58.00	58.50	59.00				
Philadelphia, deld.	59.66	60.16	60.66				
Troy, N.Y. R2	58.00	58.50	59.00				
Pittsburgh District							
Neville Island, Pa. P6	56.00	56.50	56.50				
Pittsburgh (N&S sides), Aliquippa, deld.	57.87	57.87	58.37				
McKees Rocks, deld.	57.54	57.54	58.04				
Lawrenceville, Homestead, Wilmerding, Monaca, deld.	58.16	58.16	58.66				
Verona, Trafford, deld.	58.19	58.69	58.69				
Brackenridge, deld.	58.45	58.95	59.45				
Bessemer, Pa. U5	56.00	....	56.50				
Claifton, Rankin, So. Duquesne, Pa. U5	56.00	....	....		
McKeesport, Pa. N3	56.00	....	....		
Midland, Pa. C18	56.00	....	....		

*Low phos, southern grade. †Phos, 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add \$2 per ton and each additional 0.25%, add \$1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add \$1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson, O. G2, J1 \$65.00
Buffalo H1 66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add \$1 for each 0.50% Si to 18%; \$1 for each 0.50% Mn over 1%; \$2 per gross ton premium for 0.045% max P)

Niagara Falls, N.Y. P15 \$80.50
Keokuk, Iowa, (Open-hearth & Fdry, freight allowed K2 85.00
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2 88.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland A7 (Intermediate) \$61.00

Lyles, Tenn. T3 70.00
Rockwood, Tenn. T3 70.00

Steelton, Pa. B2 64.00
Philadelphia, deld. 67.55

Troy, N.Y. R2 64.00

Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston and Los Angeles, 10 cents; Buffalo, 25 cents on C.R. and galvanized sheets, C.F. and alloy bars and 20 cents on other commodities; Houston, Seattle, Spokane, Wash., no charge.

Hot-Rolled	Cold-Rolled	SHEETS		STRIP				BARS			Standard Structural Shapes		PLATES	
		Gal. 10 Ga. t	Type 302#	H.R.*	C.R.*	H.R. Rds.	C.F. Rds. #	H.R. Alloy 4140#			Carbon	Floor		
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.52#	12.54	6.72	6.37	7.76		
Birmingham	6.35	7.35	8.25 ²	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45		
Boston	7.23	8.23	9.52	45.28*	7.47	...	7.20	8.60	12.30	7.49	7.37	8.50		
Buffalo	6.35	7.40	8.79	....	6.70	...	6.50	7.40	12.00	6.72	6.65	7.90		
Charlotte, N.C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37		
Chicago	6.38	7.38	8.30	46.05	6.62	...	6.51	7.25	11.75	6.69	6.52	7.64		
Cincinnati	6.49	7.37	8.30	46.10	6.86	...	6.75	7.55	12.00	6.88	6.81	7.89		
Cleveland	6.38	7.38	8.25	46.16	6.72	...	6.57	7.35	11.81	7.02	6.69	7.81		
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.54	11.95	7.16	6.80	7.83		
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45*	....	6.89	6.52	7.64		
Houston	7.35	7.80	9.93	....	7.70	9.30	7.70	9.50	....	7.60	7.35	8.75		
Los Angeles	7.50	9.35	9.95	50.15	7.85	11.75	7.45	10.15	13.15	7.65	7.45	9.55		
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.44	11.84	6.86	6.61	7.73		
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.60	....	7.04	6.87	....	
New York	6.97	7.91	8.79	44.95	7.56	...	7.37	8.73*	12.13	7.38	7.27	8.68		
Norfolk, Va.	7.00	....	....	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95		
Philadelphia	6.19	7.44	8.26	41.98*	6.96	8.80	6.74	7.86*	11.96	6.54	6.49	7.51**		
Pittsburgh	6.38	7.38	8.30	46.00	6.72	...	6.51	7.35	11.75	6.69	6.52	7.64		
Portland, Oreg.	7.00	7.75	8.90	48.50	7.25	...	7.05	10.20	14.00	7.00	6.85	8.75		
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08		
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.64*	12.04	7.09	6.81	7.93		
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.01	....	7.35	7.18	8.30		
San Francisco	7.55	8.95	8.70	51.65	7.80	...	7.35	10.05	13.05	7.50	7.40	9.45		
Seattle	8.10	9.80	10.15	51.00	8.20	...	7.80	10.95	13.50	7.75	7.80	9.60		
Spokane	8.35	9.65 ⁷	10.05	....	7.80	...	7.80	10.85\$	14.25	7.45	7.55	9.60		
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.05	8.16		

*Prices do not include gage extras; †prices include gage and coating extras, based on 11-cent zinc except in New York, Philadelphia, Los Angeles, Cincinnati, Cleveland, Pittsburgh, San Francisco (11.50-cent zinc) and in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **½-in. and heavier; §§annealed; §§prices include \$2 for crating; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb; stainless sheets, 8000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; 2—500 to 9999 lb; 4—4000 lb and over; 5—1000 to 1999 lb; 6—1000 lb and over; 7—1500 to 3999 lb; 8—2000 to 3999 lb; 9—f.o.b. local delivery in lots of 10,000 lb and over.



stainless steels are thoroughbred, too

The experienced exhibitor rents extra stalls...leaves them empty...to prevent contamination of his thoroughbred pets by canine neighbors.

To develop their best qualities demands *exclusive* care. That is why Sun Ship's new Alloy Products Shop has been planned for the *exclusive* fabrication of stainless and alloy steel products. When you have selected from the many available Alloys a stainless steel best suited for your service condition, you have done only half the job. You must also provide for the best possible fabrication if you are to have full protection—"A Thoroughbred Job."

Why entrust stainless steel to be fabricated in the same shop where carbon steel products are fabricated, and subject this precious metal to

contamination with iron fragments, dust, or other harmful elements? A segregated shop is your answer.

Sun Ship now operates an all-alloy shop, one especially built and equipped for fabricating stainless and alloy products as they should be—segregated from carbon steel fabrication.

We emphasize the fabrication of medium and heavy stainless, alloy and aluminum products for industry.

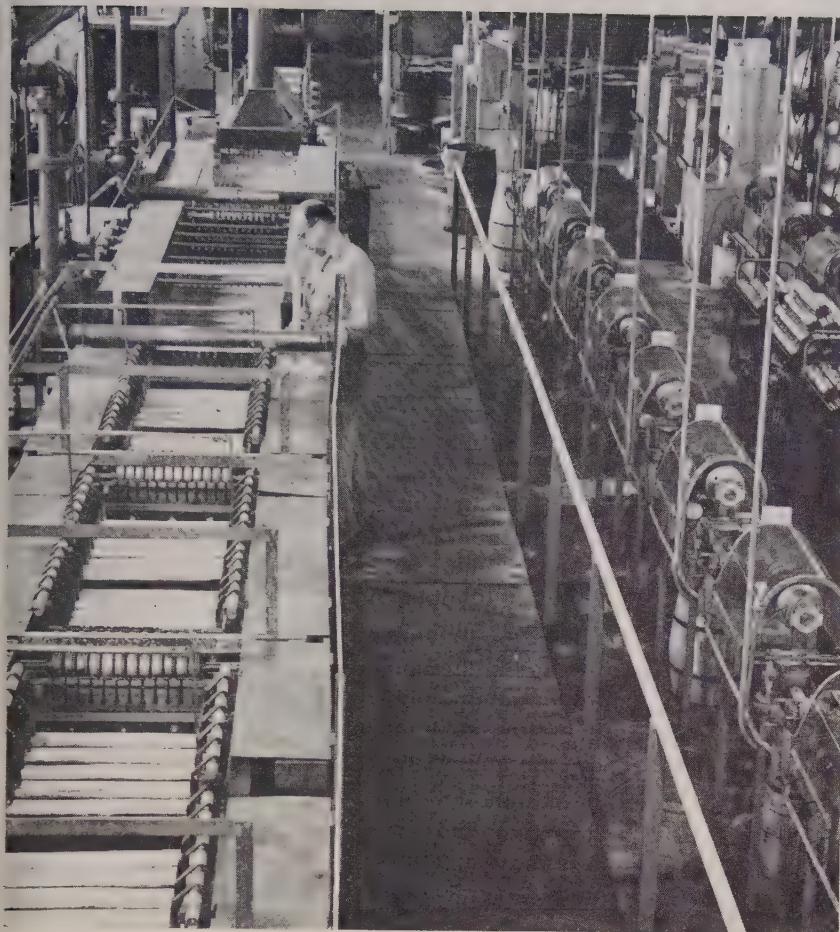
Try Sun Ship for stainless fabrication as it should be done.

Our Sales Engineering Department will be pleased to assist you with any of your fabrication problems.

Sun Ship also makes all types of carbon steel pressure vessels.

**ALLOY
PRODUCTS
SHOP**

OF **SUN SHIPBUILDING**
& DRY DOCK COMPANY
ON THE DELAWARE • CHESTER, PA. • 25 BROADWAY, NEW YORK CITY



Steel wire cord for bus and truck tires is made in the Muncy, Pa., plant of Jones & Laughlin Steel Corp. Brass plating cells (left) coat wire. On right, stranding machines take three bobbins of 0.0059-in. wire and form them into three-wire strands

were unsuccessful and World War II intervened. After the war, researchers at Jones & Laughlin Steel Corp.'s Muncy, Pa., wire rope division picked up the ball.

They discovered that the process demanded new machinery and techniques: Wire had to be drawn finer than before, then plated with brass. Rubber won't adhere to steel. Research also trimmed process costs.

Silver Lining—Now past the bottleneck, J&L can produce eight to ten times more tire cording than it could this time last year. Tire producers also are stepping up the tempo of their experimental work with rubber and synthetic tires.

The company has good reason to expect a bright outlook for its new product. Several European tiremakers use wire strands to reinforce heavy-duty tires, and J&L hopes to extend the application to other materials, such as plastics.

Wire . . .

Wire Prices, Pages 158 & 159

Demand for wire rods and manufacturers' wire items has picked up substantially. One leading eastern producer reports order volume the best entertained since early 1953. Construction is taking a larger tonnage of welded wire fabric. Merchant wire volume, although improved sea-

New Market for Wire

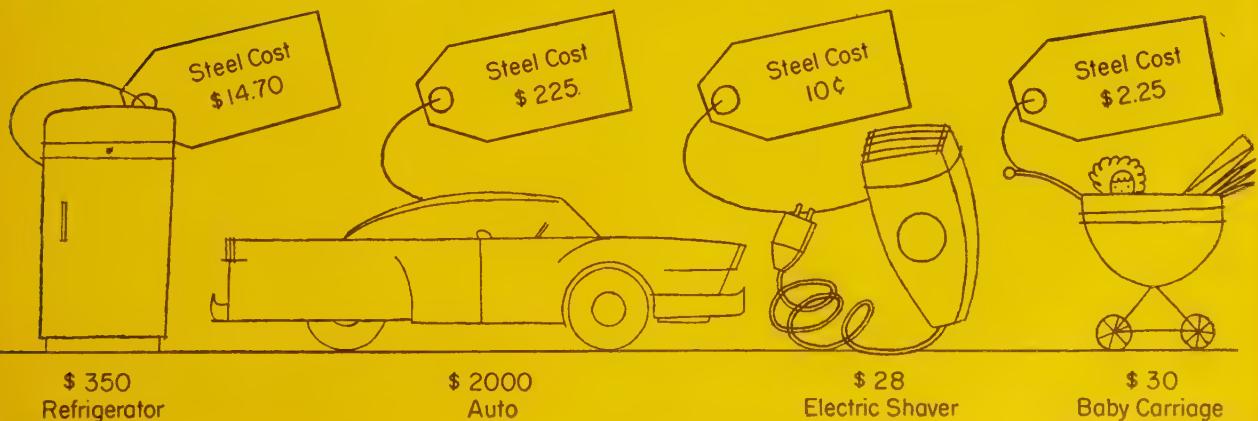
BRASS-PLATED wire promises to open a lucrative new market for steel. Now under test by major tiremakers, it may edge out vegetable fiber and synthetic cording in heavy-duty bus and truck tires. Passenger car tires are a possibility, too.

The move would not be without

precedent. Wire cording is being used to beef up the strength of rubber in power transmission and conveyor belts without an accompanying increase in weight. It also reinforces high-pressure hose.

Fifteen Years Ago—Tire manufacturers were interested in wire cording as early as 1940, but experiments

A Little Steel Goes a Long Way



Source: Armco Steel Corp.



and their fuel costs are DOWN...49%

Off to the pokey he goes. The BTU Burglar was caught red-handed stealing billions of BTU's of costly heat. But now that he's been arrested they're saving a cool 49% on fuel.

This forge furnace—which is cited because it's a typical example—had always had heavy firebrick as a lining. But the last time relining was necessary, it was decided to try lightweight B&W Insulating Firebrick. Result: Annual fuel cost went down 49%—a saving of \$4,800, and this, mind you, was in just one furnace.

Heavy furnace linings waste your fuel dollars two ways: They soak up and hold large quantities of heat which are lost when the furnace is cooled; and they conduct and lose too much heat through the walls. Lightweight insulating firebrick, containing millions of tiny air cells, heat up and cool quickly, absorbing and storing very little heat. Also, they resist heat flow, keeping it inside the furnace to do productive work.

The lighter the brick (and the lightest of all are B&W Insulating Firebrick), the more you save on fuel.

What easier way could there be to cut a major cost? You and those responsible for furnace operations in your plant will find it well worth while to talk it over with the local B&W Refractories Engineer. Or, write to B&W today for further information.

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R-505

sonally, is somewhat disappointing. Warehouse stocks of merchant items are expected to begin moving faster this month. On the West Coast, stiff competition is being offered by importers of Japanese nails. Reports are, they're being quoted \$40 to \$50 a ton under domestic nail prices.

Tool Steel . . .

Tool Steel Prices, Page 160

Shipments of high-speed and tool steel (excluding hollow drill steel) totaled 7902 net tons in February, reports the American Iron & Steel Institute. This was a slight increase, compared with 7822 tons shipped in the preceding month. The figure is up substantially from the 7431 tons reported moved in February a year ago. In the first two months of this year, shipments amounted to 15,724 tons, compared with 15,548 in the like period of 1954.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 157 & 158

Most sheet mills are out of the market for the second quarter on cold-rolled sheets, continuous galvanized sheets and certain sheet specialties, including electrical grades and enameling stock. Like tight supply conditions do not prevail in hot-rolled sheets, but some mills are definitely more extended on that item than they were a few weeks back.

Increasing tonnage is being placed for third quarter, although some mills are not officially accepting orders for that period. Pittsburgh makers, however, are reported booking cold-rolled as far ahead as August. Also, some sellers are unofficially allocating volume with carryovers into July certain. In New England, automotive users appear assured of getting the tonnage due them, but other consumers in the area anticipate some delays.

Pressure on the sheet mills, in general, appears to be a little less intense than it was. Some observers note a little more buyer caution. Duplications in automotive orders are anticipated while demand from appliance manufacturers and the warehouses is showing some irregularity. In certain circles the feeling persists that inventory building is being done. After midyear, stock building may lose some of its present lure.

Demand for flat-rolled for commercial food freezers is intense. Needs of sanitary ware makers also are active, reflecting home building. Stove requirements are brisk. Air-conditioning tonnage, however, is picking up slowly due to the heavy carryover from last year, estimated at 750,000 units. Nor is there too much stirring

DON'T LOOK NOW

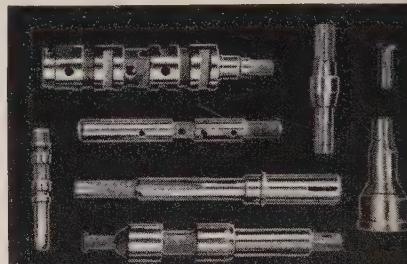
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The increased strength provided by MAN-TEN Steel gives the arch the ability to handle log loads of maximum size, and the reduced arch weight means greater mobility and maneuverability. Result: The operator can get into tight spots easier and pick up loads faster. Reduced weight also permits greater grade climbing ability in steeper terrain.

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5-1028

UNITED STATES STEEL

in the fabrication of home radio and television sets.

McLouth Steel Corp., Detroit, began production Mar. 28 on its new cold-rolled mill at Gibraltar, Mich. This mill has annual capacity of 500,000 tons and can produce sheets 56-in. wide, largely for the auto industry.

Steel Bars . . .

Bar Prices, Page 156

Continued high volume automobile assemblies and a quickening tempo in general industrial activity are combining to keep demand for bars at a good level on the Chicago mar-

ket. Cold-finishing are doing substantial business in automotive accounts currently, but they are conditioning themselves for considerably lower volume in the third quarter.

In hot-rolled bars, the farm implement industry continues to provide substantial demand. Hot bar deliveries have been steadily lengthening in recent weeks. While some tonnage can still be had within three to four weeks, the general average is more like five to six weeks.

In the East, business is good without being active. Hot rolled alloy bars are moving better than a month

ago; also cold drawn, both alloy and carbon. Deliveries depend considerably on how much hot stock is held by conversion mills.

Steady gains in orders from a wide variety of customers have given Pittsburgh district producers a two-month backlog. Some makers are taking orders for June delivery. Most mills are trying to hold down backlogs and make deliveries quickly. District sales of cold-drawn bars are

Ferroalloy Prices

FERROALLOY quotations remain unchanged. The current price schedule was published in full on page 144 of the Apr. 4 issue of STEEL.

BRING YOUR BUSINESS CARDS UP TO DATE!



best in more than a year, with automotive demand providing most of the buying spark. Warehouses also are increasing their take, while producers of screw machine products are ordering in quantity.

Bids will be closed Apr. 20 by the Navy Supply Office, Washington, on 220 tons of cold-finished bars for delivery to Glidden, Ga. The Navy Supply Office, Philadelphia, closes Apr. 13 on 500 tons of cold-finished bars.

Structural Shapes . . .

Structural Shape Prices, Page 156

With inquiries mounting and structural supply tightening, fabricators are becoming more selective in their estimating. This is notably true with those shops booked well ahead in relation to capacity.

Bridgework is perhaps the most active single sector of the market, but there is a wide diversity of other work going.

Structural steel prices are firming up somewhat, particularly on early deliveries. Fabricating shops are gradually building up order backlogs in the East, and they are figuring on considerable work. A noticeable lag, however, is noted in Pennsylvania state bridge work. This will continue until new funds are available. Appropriations are due July 1.

On the West Coast, fabricators hold fair backlogs but they require new business to assure continuance of current operations later in the year. Small jobs are increasing in the area.

Currently, it looks like June is the earliest delivery that can be obtained on wide flange sections, late May on standard shapes.

March building permits in Seattle had a value of \$7,106,560; compared with \$6,644,895 in the like month of 1954. Except for 1950, when permits

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were valued at \$8,532,470, the month's total was the highest in the last eight years. Seattle's first quarter building permit total was \$19,340,595, highest in eight years. It was \$17,068,065 in the first three months of last year.

While bridge steel booked by fabricating shops is heavy, plain structural orders covering span requirements in New England are without undue pressure. Bulk of this volume is not wanted on site for erection until well into the second half of the year. A large volume of structural beam guard rail posts is up for highways, over 100,000 feet in Massachusetts.

Tubular Goods . . .

Tubular Goods Prices, Page 160

Pipe specialties are beginning a strong comeback. After slow sales in the first quarter, producers expect improved volume this month. Users, however, still display caution in ordering.

Warehouses are replenishing stocks, with the result that the mills are filling their May order books. If demand continues at the present rate, indications are the mills will be booked solidly with May delivery tonnage well before end of this month.

Seamless pressure tubing is weak, with utility buying slow. Boiler tube demand also is sluggish in the seamless grades. Welded tube volume, though, is better, with prospects noticeably brighter for the current month.

Demand for cast iron pipe continues seasonally active. On the West Coast, bids are in on about 1500 tons in Washington and Oregon, 1194 tons being for Yakima, Wash. Pipe sale agencies expect brisk business during the entire second quarter.

Plates . . .

Plate Prices, Page 156

Plate business continues to increase. The surge in buying has filled some mill books for July, but not all producers are that far extended on deliveries. One eastern mill can give shipments in about seven weeks. Mill operations are highest in over a year.

While some tonnage is being placed for the third quarter, platemakers generally look for a tapering off in buying for that period, unless demand runs counter to seasonal influences. In New England, miscellaneous run-of-mill buying has increased moderately, but deliveries of those producers filling heavy demand for large-

diameter, electric-welded pipe are well extended. As a result, more volume is being offered mills under less demand pressure. One result: fabricators are paying higher prices through freight absorption from mills equalizing prices on items delivered into New England.

Boiler demand is spotty, but there is noticeable improvement in tank volume, particularly for the chemical and oil refining industries. Better business is noted in underground storage tanks. Turnpike and superhighway construction is providing some demand, while the warehouses

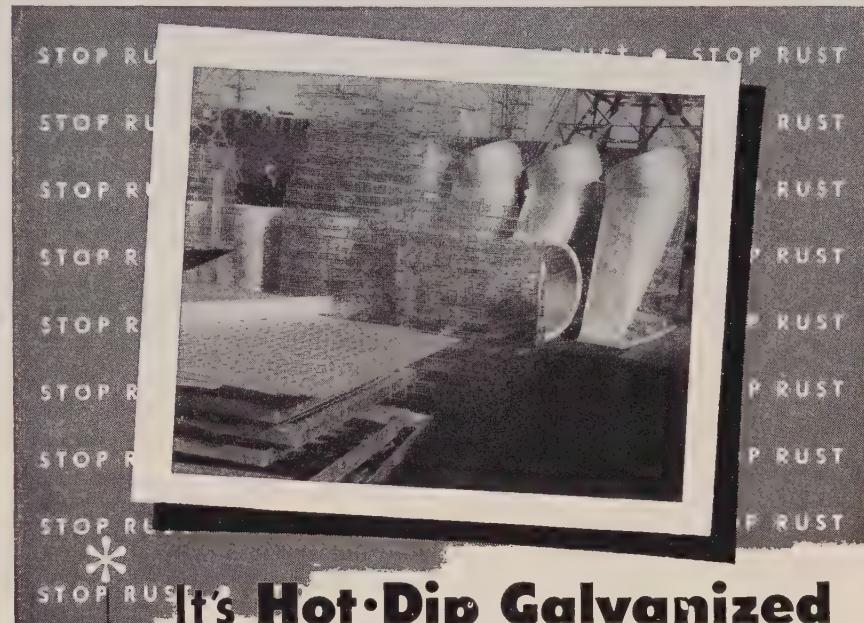
are buying more actively. Railroad requirements continue disappointing.

An outstanding inquiry involves close to 1000 tons of light stainless plates, including some heavy sheets for minesweeper paravanes. A Portland, Me., fabricator is low on the entire project.

Iron Ore . . .

Iron Ore Prices, Page 169

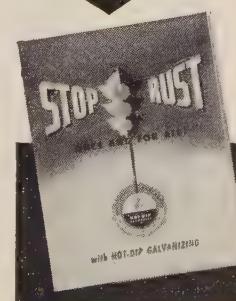
Lake ore movement is not starting so early as some shippers had planned. Unfavorable ice conditions in the upper lakes prevents passage



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Wherever iron and steel products are installed, rust is a problem. Hot Dip Galvanizing solves this problem once and for all. Here are a few of the many items that are Hot Dip Galvanized: steel plates, frames, wire baskets, duct work and many others. You, as a fabricator of steel products, are interested in protecting them from rust. The best way is to have them Hot Dip Galvanized. Here's why: with Hot Dip Galvanizing you get the thickest, most uniform coating with no open pores to let rust begin—thus costly maintenance over a period of years is reduced to a minimum and necessity for replacement is eliminated.

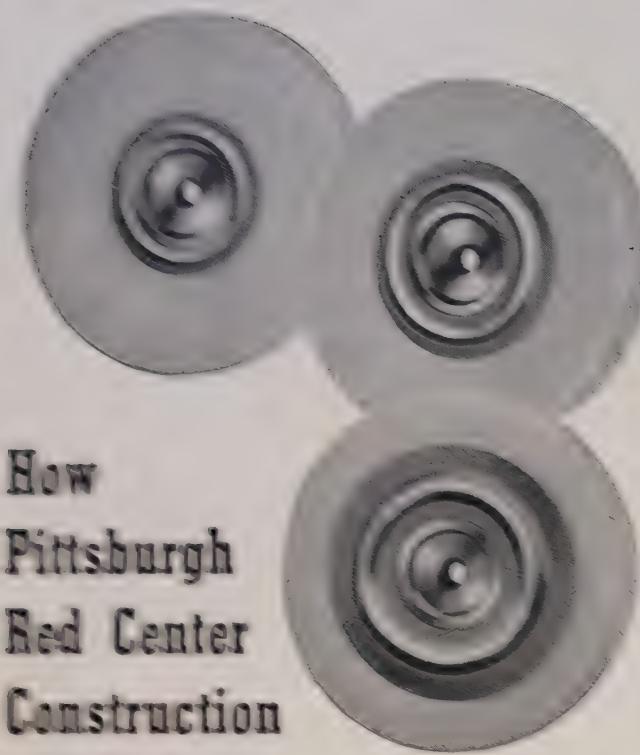
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This is just one example of superior Pittsburgh construction, engineered for both general and specific applications. For details of the complete line, write to the Sales Dept., Address: Pittsburgh Red Center Wire Co., Brush Div., Dept. OA-322, Pittsburgh, Pa. Subsidiary of U.S. Steel Corp.

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of iron ore carriers through the Soo locks and into the iron ore loading ports of Lake Superior. Ice in Lake Superior is reported to be the worst for this season since 1933.

Vessels are moving on the lower lakes, however. On Mar. 31, Inland Steel Co. opened its 1955 shipping season when its motor ship, *J. E. Block*, left Indiana Harbor for Port Inland at the northern tip of Lake Michigan for a cargo of limestone.

Pig Iron . . .

Pig Iron Prices, Page 161

Mystic Iron Works, Everett, Mass., subsidiary of Eastern Gas & Fuel Associates, Boston, has extended its base price of \$61 on foundry pig iron for the second quarter. Differentials for silicon, phosphorus and manganese also are unchanged.

Demand for merchant foundry pig iron is improving slowly. Automotive requirements continue to be the keystone in foundry activity, with construction needs running a close second. In the East, foundries are operating an average of about four days a week.

Pig iron producers expect business in April and May to maintain about the same rate as in March.

In the St. Louis area, pig iron production and consumption are in balance. Ground stocks are adequate for the district's occasional bulge in demand, but not for new customers. Orders received from consumers outside the district usually are turned down, except for hardship cases.

Foundry order backlogs in the Los Angeles area extend to five weeks, with most melters operating above 90 per cent of capacity. One foundry completed a large purchase of eastern pig iron to overcome a local shortage.

Jones & Laughlin Steel Corp., will return its A-2 blast furnace at Aliquippa, Pa., to operation immediately. This will place all five stacks at that plant in production.

Rails, Cars . . .

Track Material Prices, Page 159

Improving revenues are causing railroads to take a second look at their track laying programs for this year and to seek additional rail tonnages for delivery in the second quarter. Since contracts for rails are usually long-term matters, few mills are able to allot them much more ingot tonnage than is already scheduled.

Desire of the carriers to speed deliveries has a price overtone. Rails received in the second quarter conceivably may have a lower price tag

Ores

Lake Superior Iron Ore

(Prices effective for the 1955 shipping season; gross ton, 51.50% iron natural, rail of vessel, lower lake ports)	
Old range bessemer	\$10.40
Old range nonbessemer	10.25
Mesabi bessemer	10.25
Mesabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore

Cents per unit, del'd. E. Pa.	
Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports	
Swedish basic, 60-68%	20.00
N. African hematite (spot) ..nom. 18.00-20.00	
Brazilian iron ore, 68-69% (spot) ..24.00-26.00	

Tungsten Ore

Net ton unit, before duty	
Foreign, wolframite, good commercial quality	\$25.00-\$26.00
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 85c-87c per long ton unit	
c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.	

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.	
<i>Indian and African</i>	
48% 2.8:1	nom. \$40.00-\$42.00

48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	\$19.00-\$20.00
48% no ratio	31.00-32.00

Domestic

Rail nearest seller	
18% 3:1	\$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	
56-60%	\$3.25-\$3.80

65%	4.15-4.25
Vanadium Ore	

Cents per lb, V ₂ O ₅ content, del'd. mills	
Domestic	31.00

Runners (per 1000)

Reedsdale, Johnstown, Bridgeburg, Pa., \$183.50;
Clearfield, Pa., \$185.50; St. Louis, \$195.80;
Athens, Tex., \$191.80.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., \$14.50; Thornton, McCook, Ill., \$15.10; Dolly Siding, Bonne Terre, Mo., \$13.65.
Magnesite (per net ton)

Domestic, dead-burned bulk, % in, grains with fines: Luning, Nev., Chewelah, Wash., \$38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	\$13.50-\$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	\$24.50
Camden, N. J., ovens	24.00
Everett, Mass., ovens	
New England, del'd.	*26.05
Chicago, ovens	24.50
Chicago, del'd.	26.00
Terre Haute, Ind., ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, del'd.	25.85
Painesville, O., ovens	25.50
Cleveland, del'd.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, del'd.	27.58
Buffalo, ovens	25.00
Buffalo, del'd.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	24.00
Swedeland, Pa., ovens	24.00
St. Louis, ovens	
St. Louis, del'd.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, O., del'd.	26.62
Detroit, ovens	25.50
Pontiac, del'd.	27.06
Saginaw, del'd.	28.58

*Or within \$4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	38.00
Toluol, one deg.	32.00-35.00
Industrial xylo	32.00-35.00
Per ton, bulk, ovens	
Sulphate of ammonia	\$42-\$45
Birmingham area .....	.42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF₂ content 72.5%, \$35-\$36; 70%, \$32-\$33; 60%, \$28-\$29. Imported, net tons, duty paid, metallurgical grade: European, \$28-\$30; Mexican, \$25.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE		Per
Diam	Length	
2	24	\$47.75
2½	30	30.75
3	40	30.00
4	40	23.50
5½	40	23.25
6	60	25.50
7	60	25.25
8, 9, 10	60	22.75
12	72	26.00
14	60	22.50
16	72	21.50
17	60	22.00
18	72	21.50
20	72	21.25
CARBON		
8	60	11.40
14, 12, 10	60	11.10
14	72	10.25
17	60	9.85
17	72	9.85
20	84	9.85
20	90	9.65
24	72, 84	9.85
24	96	9.60
30	84	9.75
40, 35	110	9.50
40	100	9.50

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than those shipped in the third quarter, assuming steelworkers win a wage increase.

General Services Administration reports the best bids for furnishing 400 car wheels for the Alaska Railroad have been submitted by U. S. Steel Corp., and Edgewater Steel Co. in various schedules. The offers have been recommended for acceptance to Washington.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 169

Following the lead of one eastern district oven foundry coke producer, the two remaining producers in the area advanced their prices to the same level—\$24, ovens, Swedeland, Pa., and Camden, N. J. The increase of \$1 per ton reflects increased costs resulting from higher wages and loss of by-product gas contracts to natural gas.

Plans for construction of a battery of 31 by-product coke ovens at Republic Steel Corp.'s Massillon, O., works were announced last week. Improvements will include relining of the blast furnace, which has a daily capacity of 680 tons of iron.

Warehouse . . .

Warehouse Prices, Page 161

Steel distributors in the Chicago area have increased prices an average of about \$7 a ton on seconds and waster sheets, because of higher mill prices on these products. Products involved include pickled hot-rolled and cold-rolled sheets.

This price situation always develops when heavy prime sheet consumption and tight supplies are coupled. Competition for this business results in frequent price fluctuations. Prices on prime products remain stable and unchanged.

As expected, spring brings an increase in demand from the construction industry. Structural shapes and plate are moving at such a fast pace distributors are unable to get sufficient deliveries from mills to maintain stocks. Sales of wire used in construction also are increasing. In most districts, light, flat-rolled products are moving well and most distributors expect business volume this month to exceed that of March, which was the best month so far this year.

In the Pittsburgh district, sheet distribution lags with few small users of that product in the market. Emergency requirements from fabricators who usually obtain deliveries from mills are few and far between.

POWDER METALLURGY can duplicate this part for

**61%
LESS**



MACHINED PART — 18¢
POWDERMET* PART — 7¢

Don't cut parts—Cut Costs!
—with YALE Powdered Metal Parts

When it comes to keeping production costs down, American industry turns more and more to powder metallurgy. For here are tough, accurate parts completely ready for assembly...that not only do the job more cheaply, but often better!

With identical machined parts, most of the cost goes into the expensive machining operation. The price of one machined part will buy up to six of the same parts in powdered metal!

Close tolerances, excellent wear-

ability, and controlled porosity are established Powdermet* virtues. Special properties—such as self-lubrication, or unusual electrical characteristics—can also be achieved. Alloys are available exceeding the tensile strength of mild steel.

The answer to your production problems may well be Powdermet* parts...and Yale & Towne. For Yale & Towne has the experience and know-how to serve you best in this rapidly-developing new field.

A qualified Yale & Towne engineer is available to discuss the advantages and limitations of powdered metal parts—right in your own plant! He will show you how powder metallurgy may cut costs in your production operations. There is no obligation for this engineering counsel.

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Bearings	Cams
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Send Booklet Send information on PM parts for attached
specifications or drawings.

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Name..... Title.....

Company.....

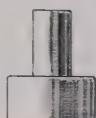
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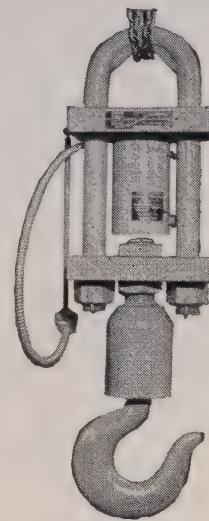
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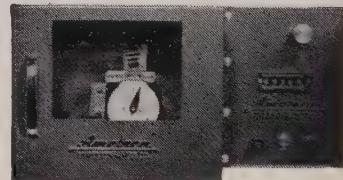
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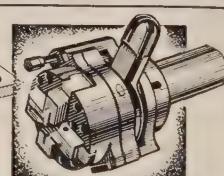
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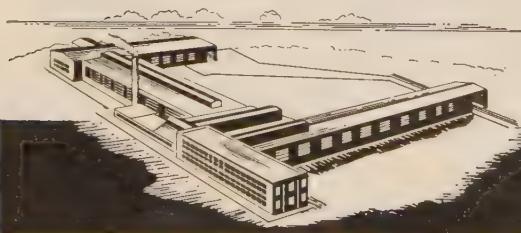
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Scrap . . .

Scrap Prices, Page 174

New York—Brokers' buying prices are easier, with reductions in No. 1 heavy melting and No. 1 bundles to \$32-\$32.50 and in No. 2 heavy melting to \$28-\$28.50. Prices also have been reduced on machine shop turnings to \$12-\$13, mixed borings and short turnings to \$14-\$15 and short shovel turnings to \$15-\$16. No. 2 bundles are unchanged at \$24-\$25, low phos at \$34-\$35. Prices on cast iron grades are steady. Behind the present softness is an easier flow of scrap owing to improved weather.

Railroads serving the Port of New York are making proposals to increase the scrap export carload rate from certain points in New York City to loading docks in New Jersey. One proposal is to increase the carload rate from \$2.20 per gross ton (effective since last June) to \$3.23.

Cleveland—The undertone of the scrap market here is noticeably softer. But the condition is not reflected in prices, largely because of the absence of representative consumer buying. Because industrial lists were moved a week ago at prices sharply under those previously paid (narrowing the spread between industrial and dealer scrap to about 50 cents per ton) expectations are dealer scrap will go down correspondingly on the next mill purchase.

Pittsburgh—In spite of open hearth operations above 95 per cent of capacity, scrap demand is softening. The only price changes are downward, in No. 2 heavy melting, No. 2 bundles and punchings and plate scrap. No. 1 heavy melting is unchanged.

Boston—The triple price structure for scrap in New England is marked by slower domestic volume, notably for eastern Pennsylvania. Dealers' buying prices are largely based on district buying and dock shipments with freight, usually under \$5, a factor. The old influence of Pittsburgh on New England scrap prices has practically disappeared. Central Massachusetts is buying No. 1 steel, but it must be good quality at \$31 to \$32, shipping point; for dock, \$33-\$34 is paid.

Buffalo—Prices on No. 2 steelmaking grades of scrap dropped \$1.50 a ton here on purchases by the leading mill consumer.

Philadelphia—While there is a slightly easier undertone, most steel grades are unchanged and cast grades are steady. Domestic demand for steel scrap is chiefly for relatively small tonnages, with scrap

flow easier and fairly good consumer inventories. Also, pressure from abroad has eased.

Detroit—Local consumers are not active in the scrap market, but demand from outside has pushed prices up. Cast grades are particularly strong.

Los Angeles—With auto wrecking slower, collection of steelmaking scrap has declined.

Seattle—Bullish factors have resulted in another \$2 rise in prices on No. 1 and No. 2 heavy melting steel, now quoted at \$33 and \$29, respectively.

Washington—Consumption of purchased scrap is not keeping pace with production of steel ingots and iron and steel castings for which scrap is an important raw material, points out Edwin C. Barringer, executive vice president, Institute of Scrap Iron & Steel Inc.

Owing to proportionately greater use of pig iron and home scrap, the melt of purchased scrap is running at only about 90 per cent of the previous record in 1951, which was 33 million gross tons.

Cincinnati—The scrap market seems to have lost some of its momentum. Prices must be shaded \$1 to \$1.50 a ton at times to find

(Please turn to page 176)

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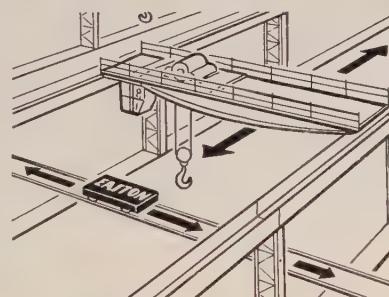
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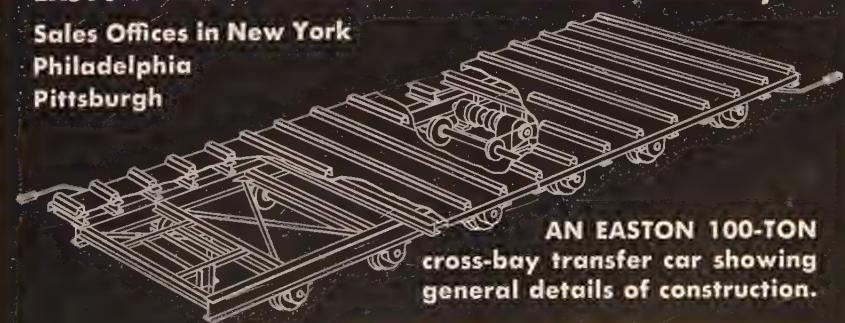
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cross-bay transfer car showing
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A-1046

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported
STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Apr. 6	\$37.41
Mar. 30	37.41
Mar. Avg.	37.50
Apr. 1954	25.67
Apr. 1950	29.40

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting...	38.00-39.00
No. 2 heavy melting...	34.00-35.00
No. 1 bundles	38.00-39.00
No. 2 bundles	29.00-30.00
No. 1 busheling	38.00-39.00
Machine shop turnings	22.00-23.00
Mixed borings, turnings	22.00-23.00
Short shovel turnings	26.00-27.00
Cast iron borings	26.00-27.00
Cut structural, 5 ft lengths	41.00-42.00
Heavy turnings	35.00-36.00
Punchings & plate scrap	41.00-42.00
Electric furnace bundles	39.00-40.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	33.00-34.00
Heavy breakable cast	33.00-34.00
Unstripped motor blocks	22.00-23.00
No. 1 machinery cast	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00-42.00
Rails, 2 ft and under	51.00-52.00
Rails, 18 in. and under	52.00-53.00
Rails, random lengths	47.00-48.00
Railroad specialties	44.50-45.50

Stainless Steel Scrap

18-8 bundles & solids	.210.00-220.00
18-8 turnings	.105.00-110.00
430 bundles & solids	.95.00-100.00
430 turnings	.60.00-65.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting...	34.00-36.00
No. 2 heavy melting...	31.00-32.00
No. 1 bundles	34.00-36.00
No. 2 bundles	28.00-29.00
No. 1 busheling	34.00-36.00
Machine shop turnings	17.00-18.00
Mixed borings, turnings	24.00-25.00
Short shovel turnings	24.00-25.00
Cast iron borings	24.00-25.00
Low phos.	34.00-36.00
Cut structural plate 2 ft and under	41.50-42.00
Alloy free, short shovel turnings	26.50-27.50
Electric furnace bundles	34.00-36.00

Cast Iron Grades

No. 1 cupola	43.00-44.00
Charging box cast	37.00-38.00
Stove plate	40.00-42.00
Heavy breakable cast	34.00-35.00
Unstripped motor blocks	29.00-30.00
Brake shoes	32.00-33.00
Clean auto cast	46.00-47.00
No. 1 wheels	43.00-44.00
Burnt cast	33.00-34.00
Drop broken machinery	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
R.R. malleable	45.00-46.00
Rails, 2-ft and under	50.00-51.00
Rails, 18-in. and under	51.00-52.00
Rails, random lengths	45.00-46.00
Cast steel	39.00-40.00
Railroad specialties	39.00-40.00
Uncut tires	41.00-42.00
Angles, splice bars	46.00-47.00
Rails, rerolling	52.00-53.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)	
18-8 bundles, solids	.190.00-200.00
18-8 turnings	80.00-90.00
430 clips, bundles, solids	80.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting...	37.00-38.00
No. 2 heavy melting...	32.00-33.00
No. 1 bundles	37.00-38.00
No. 2 bundles	27.50-28.50
No. 1 busheling	37.00-38.00
Machine shop turnings	18.00-19.00
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Low phos.	37.00-38.00
Electric furnace bundles	37.00-38.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
------------------------	-------------

CHICAGO

(Delivered consumer plant)

No. 1 heavy melting...	35.00-37.00
No. 2 heavy melting...	32.00-33.00
No. 1 dealer bundles	35.00-36.00
No. 2 bundles	24.00-25.00
No. 1 busheling	35.00-37.00
Machine shop turnings	18.00-19.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut structures, 3 ft	37.00-38.00
Punchings & plate scrap	38.00-39.00
Electric furnace bundles	36.00-37.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Stove plate	36.00-37.00
Unstripped motor blocks	28.00-29.00
Clean auto cast	46.00-47.00
Drop broken machinery	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	38.00-39.00
R.R. malleable	45.00-46.00
Rails, 2-ft and under	50.00-51.00
Rails, 18-in. and under	51.00-52.00
Angles, splice bars	44.00-45.00
Rails, rerolling	52.00-53.00

Stainless Steel Scrap

18-8 bundles & solids	.220.00-225.00
18-8 turnings	.95.00-100.00
430 bundles & solids	.105.00-110.00
430 turnings	.45.00-50.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting...	29.50
No. 2 heavy melting...	23.00
No. 1 bundles	30.00-31.00
No. 2 bundles	18.00-20.00
No. 1 busheling	13.00
Machine shop turnings	13.00
Mixed borings, turnings	13.00
Short shovel turnings	17.50
Punchings & plate scrap	34.00

Cast Iron Grades

Charging box cast	28.00
No. 1 cupola	37.00
Stove plate	32.00
Heavy breakable	28.00
Unstripped motor blocks	20.00
Clean auto cast	42.00
Malleable	35.00

BIRMINGHAM

No. 1 heavy melting...	32.00-33.00
No. 2 heavy melting...	27.00-28.00
No. 1 bundles	32.00-33.00
No. 2 bundles	23.00-24.00
No. 1 busheling	32.00-33.00
Cast iron borings	17.00-18.00
Short shovel turnings	25.00-26.00
Machine shop turnings	18.00-19.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades

(F.o.b. shipping point)	
No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate	36.00-37.00
Structural plate, 2 ft	36.00-37.00
Unstripped motor blocks	35.50-36.50

Cast Iron Scrap

No. 1 R.R. heavy melt.	36.00-37.00
Rails, 18-in. and under	43.50-44.50
Rails, rerolling	43.00-44.00
Rails, random lengths	39.00-40.00
Angles, splice bars	40.00-41.00
Stand. steel axles	35.00-36.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting...	37.50-38.00
No. 2 heavy melting...	34.00
No. 1 bundles	37.50-38.00
No. 2 bundles	30.00
No. 1 busheling	37.50-38.00
Electric furnace bundles	40.00
Machine shop turnings	22.50
Mixed borings, turnings	22.00
Short shovel turnings	25.00
Structurals & plate	41.00-42.00
Heavy turnings	34.00-35.00
Couplers, springs, wheels	42.50
Rail crops, 2 ft & under	52.00-53.00

Cast Iron Grades

No. 1 cupola	38.00
Malleable	44.00
Heavy breakable cast	41.00
Drop broken machinery	44.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting...	32.00-32.50
No. 2 heavy melting...	28.00-28.50
No. 1 bundles	32.00-32.50
No. 2 bundles	24.00-25.00
Machine shop turnings	12.00-13.00
Mixed borings, short turnings	14.00-15.00
Short shovel turnings	15.00-16.00
No. 1 cast	30.00-31.00
Mixed cupola cast	30.00-31.00
Low phos. (structural & plate)	34.00-35.00

Cast Iron Grades

No. 1 cupola	30.00-31

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for Mills & Foundries Since 1889*

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STAINLESS • CARBON • BRONZE

REPRESENTATION IN PRINCIPAL CITIES

(Concluded from page 173)

a buyer. Brokers and dealers admit they don't know which way prices will go. Two rail items underwent minor adjustments last week. Rails, 18 in. and under, advanced \$1 to \$48-\$49, while random length rails slipped \$1.50 to a range of \$40-\$41.

Chicago—The scrap market has a stronger tone although mill buying is considerably below consumption requirements. Factory bundles machine shop turnings, mixed borings and turnings and cast iron borings are a little stronger.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

23,324 tons, state Patapsco tunnel project and shafts, Baltimore, awarded through Merritt-Chapman & Scott, New York, general contractor. Of the 21 prefabricated tunnel sections, comprising 19,800 tons, 12 were allotted to the Sparrows Point plant of the Bethlehem Steel Co., Bethlehem, Pa., with four to be fabricated by the Maryland Dry Dock Co., Baltimore, and the remaining sections awarded to the New York Shipbuilding Corp., Camden, N. J. Details of the remaining 3524 tons of structural steel announced. Merritt-Chapman & Scott will also place 9055 tons of reinforcing bars and 410 tons of wire and mesh along with other miscellaneous requirements. J. E. Greiner Co., North Charles street, Baltimore, is consulting engineer.

3026 tons, two, 12-story apartments, 423 E. 53rd St., New York, to Schacht Steel Construction Inc., New York; owner and general contractor is Kessler-Wohl Associates.

2120 tons, sheet steel piling, concrete and sea wall, Hampton, N. H., divided equally, U. S. Steel Corp., Pittsburgh, and Bethlehem Steel Co., Bethlehem, Pa.; Northern Construction Co., Lawrence, Mass., general contractor; Phoenix Bridge Co., Phoenixville, Pa., will fabricate 165 tons of structural steel.

2075 tons, ten bridges, Massachusetts turnpike, Framingham-Natick-Wayland, Mass., to Towerr Iron Works, Cambridge, Mass., through M. DeMatteo Construction Co., Quincy, Mass., general contractor.

1850 tons, 11 bridges, Massachusetts turnpike, Framingham-Natick-Wayland, Mass., to Towerr Iron Works, Providence, R. I., through J. F. White Construction Co., Cambridge, Mass., general contractor.

550 tons, shop and office building, Mason-Nelson Regulator Co., Norwood, Mass.; 350 tons fabricated structural to Morris-Wheeler & Co., Philadelphia; 200 tons, long span joists to Bethlehem Steel Co., Bethlehem, Pa.; 70 tons, reinforcing bars, to Northern Steel Co., Medford, Mass.; George A. Fuller Co., Boston, general contractor.

440 tons, high school, Shellington, Pa., to Reading Metalcraft Co., Reading, Pa.

320 tons, U. S. National Bank building, Portland, Oreg., to A. Young & Sons Iron Works, Portland.

300 tons, penstock and appurtenances, Glendam, Missouri River Basin project, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

300 tons, infirmary buildings, state school, Rome, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; F. E. Rich Co., Stamford, Conn., general contractor.

270 tons, high school, Danville, Va., to Truitt Mfg. Co., Greensboro, N. C.; John W. Daniel Co., Danville, Va., general contractor; 50 tons of reinforcing bars to Montague-Betts Co., Richmond, Va.

250 tons, galvanized transmission towers, Seattle, City Light Department, to Bethlehem Pacific Coast Steel Corp., Seattle.

STRUCTURAL STEEL PENDING

3980 tons, 25 bridges, Massachusetts turnpike, West Stockbridge-Stockbridge-Lee, Mass.; B. Perini & Sons, Framingham, Mass., low on general contract at \$10,317,533.

3650 tons, highway structures, Indiana toll road, Lake county; bids Apr. 20, Indianapolis.

2015 tons, seven bridges, Massachusetts turn-

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AND MOST MODERN
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FOUNDRIES

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Phone: Gospee 1-5573, 1-8573

pike, Palmer, Mass.; bids Apr. 12, Boston; also 25,000 linear feet of steel piling.
 1815 tons, 11 bridges, Massachusetts turnpike, Framingham-Natick-Wayland, Mass.; J. F. White Construction Co., Cambridge, Mass., low on general contract; also 39,320 linear feet of steel piling.
 530 tons, state highway bridge, Aroostook river, Ft. Fairfield, Me.; bids Apr. 20, Augusta, Me.; also 1450 linear feet of steel piling.
 195 tons, three bridges, Massachusetts turnpike, Sturbridge, Mass.; bids Apr. 14, Boston.
 475 tons, beams, General Stores Supply Office, Navy, Philadelphia; bids Apr. 13.
 340 tons, steel sheet piling, Ludington, Mich., Corps of Engineers, Milwaukee.
 200 tons, Galena, Alaska, military project; general contract to Peter Kiewit Sons Co., Seattle, low at \$4,812,102.

REINFORCING BARS . . .

REINFORCING BARS PLACED

200 tons, infirmary buildings, state school, Rome, N. Y., to Webrill Steel Co., New York; F. E. Rich Co., Stamford, Conn., general contractor.
 125 tons, Northgate School, Seattle, to Northwest Steel Rolling Mills, Inc., Seattle; Carl Anderson, Seattle, general contractor.

REINFORCING BARS PENDING

2465 tons, 25 bridges and culverts, West Stockbridge-Stockbridge-Lee, Mass.; B. Perini & Sons, Framingham, Mass., low on general contract; also 100 tons of steel sheet piling.
 1165 tons, 11 bridges, Massachusetts turnpike, Framingham-Natick-Wayland, Mass.; J. F. White Construction Co., low on general contract.
 1150 tons, highway structures, Indiana toll road, Lake county, contracts C-1 and C-2; bids Apr. 20, Indianapolis.
 1045 tons, seven bridges, Massachusetts turnpike, Palmer, Mass.; bids Apr. 12, Boston.
 225 tons, bridge substructure, State street, Connecticut river, Hartford-East Hartford, Conn.; Savin Construction Corp., East Hartford, low on general contract.
 215 tons, three bridges, Massachusetts turnpike, Sturbridge, Mass.; bids Apr. 14, Boston.

PLATES . . .

PLATES PENDING

800 tons, hull, approximately one-half high tensile, General Stores Supply Office, Navy, Philadelphia; bids Apr. 12.

PIPE . . .

CAST IRON PIPE PENDING

2685 tons, 24 in., City Water Authority, Bradford City, Pa.; bids with alternate on steel pipe, 23,750 linear feet, Apr. 18.
 100 tons, 10 to 6 in., also pump plant and steel reservoir; bids to Irvin Water District, Spokane, Wash., Apr. 15.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Central of Georgia, six, 1750-hp diesel road switching units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.
 Chicago & Illinois Midland, two, 1200-hp diesel switching units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.
 Nickel Plate, thirty-two 1750-hp diesel road switching units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

RAILROAD CARS PLACED

Chicago & Northwestern, 750 seventy-five-ton ore cars to the Johnstown, Pa. plant of the Bethlehem Steel Co., and 226 fifty-ton box cars to the Michigan City, Ind. plant of Pullman-Standard Car Mfg. Co., Chicago. This equipment had been erroneously noted as placed by the Chicago & Great Western, Western Pacific, 270 box cars and 50 flat cars, to Pullman-Standard Car Mfg. Co., Chicago.

RAILROAD CARS PENDING

Chesapeake & Ohio, 250 fifty-ton box cars with special loaders; alternate estimates also asked on 500; bids closed Apr. 4.
 Erie, 300 fifty-ton box cars; bids closed Apr. 4.

OVERHEAD TRAVELING CRANE DESIGN ENGINEER

Graduate engineer with substantial experience in design, construction and executive responsibility wanted to assume charge of engineering department in overhead traveling crane manufacturing plant. Give full details of professional and executive experience, salary requirements, etc.

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FOR SALE

One Automatic Cut-Off Shear, Capacity 48" wide x 16 gauge, consisting of shear roll feed with straightener and uncoiling equipment. In excellent condition, operated less than four years. Reply Box 239, STEEL, Penton Building, Cleveland 13, Ohio.

Help Wanted

INDUSTRIAL SALESMAN or SALES TRAINEE, age 25-35, for established supplier furnishing basic raw material to the iron and steel industry. Metallurgical education or knowledge of iron and steel melting essential. Territory—Eastern Pennsylvania, New Jersey and Eastern New York. Prefer applicant now living in this area. Salary commensurate with experience plus expenses. Reply Box 230, Penton Building, Cleveland 13, Ohio, advising previous experience, qualifications and salary expected.

WANTED—TOOL STEEL SALESMAN for Chicago area. Straight salary. State experience and full information. Reply Box 241, STEEL, Penton Building, Cleveland 13, Ohio.

Representatives Wanted

RESPONSIBLE INDUSTRIAL SALES COMPANIES OR INDEPENDENT SALES ENGINEERS urgently required to aggressively represent well known Eastern manufacturer of Industrial X-Ray and Radiation handling apparatus in Continental United States and Canada. Kindly furnish information relative to territory covered and technical experience—if any—in Nondestructive Testing field. Reply Box 243, STEEL, Penton Building, Cleveland 13, Ohio.

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EXECUTIVE ENGINEER
 Heavy background in Metal Industry covering all phases as Works Manager, Chief Production Engineer, Assistant Chief Engineer in the white appliances. Seasoned in government contracting, labor relations, factory cost, purchasing, capital equipment, and all phases of Manufacturing, Engineering and Sales. Reply Box 240, STEEL, Penton Building, Cleveland 13, Ohio.

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when
operating
conditions . . .



If service conditions are unusually rugged and you're troubled by high manufacturing costs—look to pearlitic malleable castings!

Pearlitic malleable has high fluidity that casts easily into complicated shapes. It resists wear under heavy loads at high speeds . . . has high ultimate strength . . . possesses excellent non-seizing properties for bearing surfaces . . . can be given a very smooth finish where desired . . . and can be either liquid quenched

or air quenched. And perhaps most important of all, pearlitic malleable machinability index ranges from 80 to 90 (B112 steel = 100).

So look your product over critically. Then check pearlitic malleable castings. They can replace more expensive methods of fabrication or manufacture . . . can lead to reduced weight, less machining time . . . fewer assembly operations . . . greater sales appeal for your product.

AA-166

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Cleveland 6, Ohio

The Nation's largest independent producer of malleable and pearlitic malleable

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Cleveland 6, Ohio

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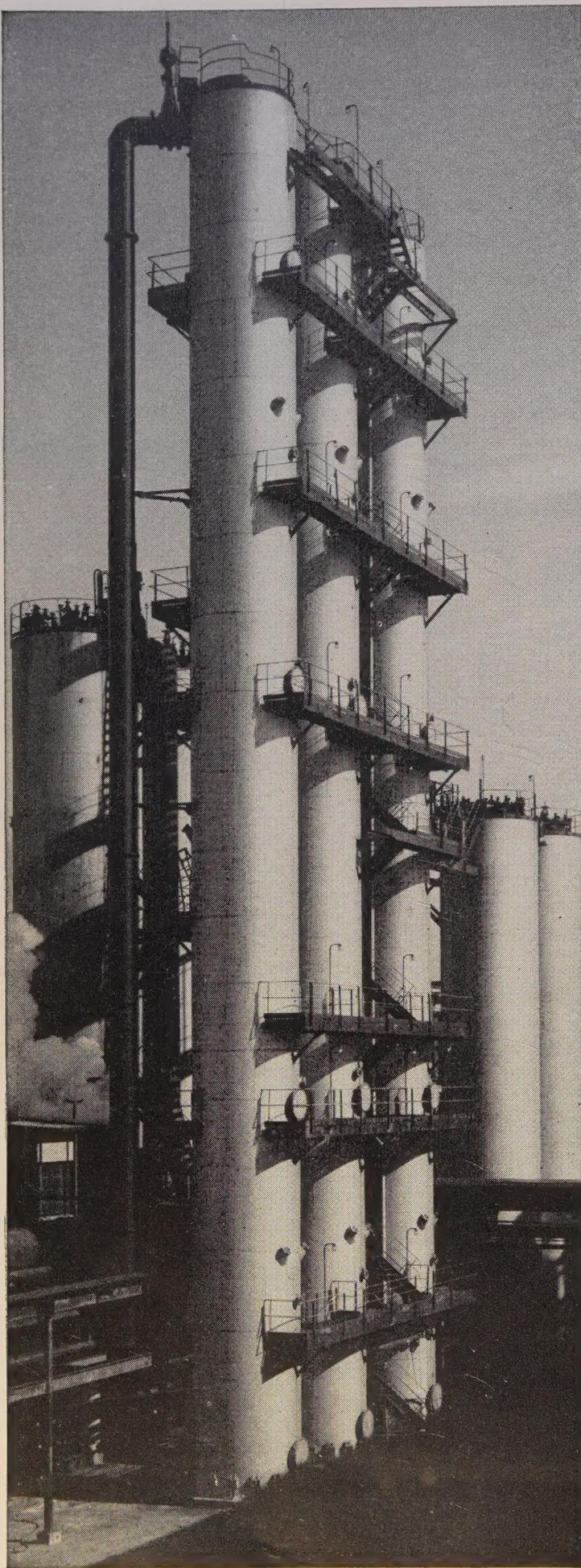
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Gas and Chemical “scrubbers” for Great Lakes Steel

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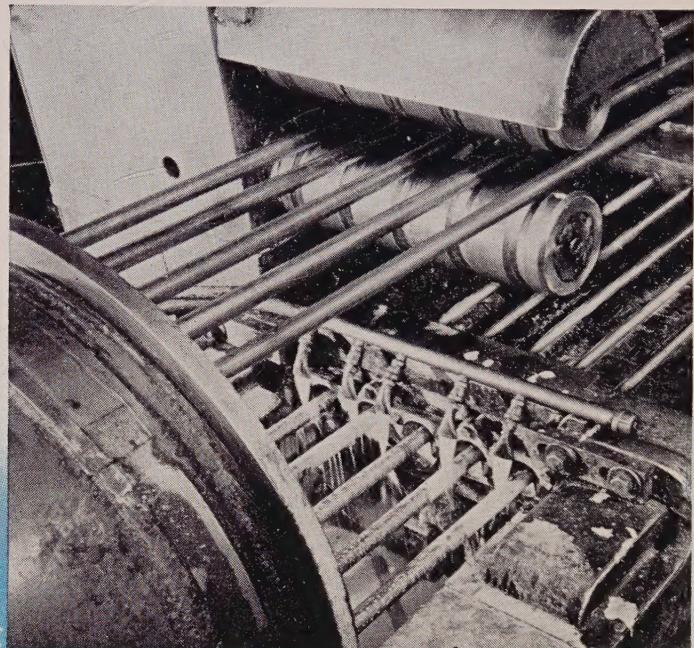
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PRODUCTION COSTS**

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